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ABSTRACT

An overview of environmental education programs throughout the United States is presented in this Education U.S.A. Special Report by the National School Public Relations Association. Six statewide and seven local programs are described which represent comprehensive and well conceived plans and display outstanding features. However, most programs lacked in some degree three criteria advocated by many authorities in the field: (1) environmentalism should be worked into every subject in the curriculum, (2) environmental education should be part of the school program from kindergarten through high school, and (3) environmental education should operate throughout the entire school year, with some summer experience outdoors if possible. Developments in higher education are also noted together with national programs of environmental education, the philosophy and objectives of environmental education, and a summary of the Environmental Education Act of 1970. (BL)

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This Is an Education U.S.A. Special Report

Education U.S.A., a weekly newsletter founded in 1958, has introduced new dimensions to educational journalism in the United States. In addition to the newsletter, which reports major developments in preschool to graduate level education, the editors of *Education U.S.A.* prepare special in-depth reports on current education issues and problems.

News and interpretive features for the newsletter, based on materials from hundreds of sources, are written by the editors of *Education U.S.A.* and by correspondents in the 50 states. The aim: to keep the busy American educator informed of the important developments in his profession. The *Washington Monitor* section of *Education U.S.A.* is a current report on activities at the U.S. Office of Education, Capitol Hill, and other federal agencies that make significant decisions in education. Each year the editors also prepare *The Shape of Education*, a special handbook of articles on trend-making subjects in American education.

The special reports are prepared when the editors decide that a new development in education is important enough to be covered in detail. *Environment and the Schools* is the 25th report in this series.

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environment and the schools

Pioneer Programs Set the Pace For States and Districts

OVERVIEW

Although environmental education is increasingly engaging the enthusiasm of American educators, few students are as yet exposed to it. Moreover, measured against the standards of authorities in the field, much of what is labeled as environmental education falls seriously short of being really that.

As for numbers: The National Education Assn. (NEA) found in a late-1970 survey that only 781 of the nation's 7,143 school districts with enrollments of 1,000 or more--11% of them--have environmental education programs large enough to employ a staff person at least half time.

As for quality: The editors of Education U.S.A. looked at environmental education programs in action, as reported principally by state departments of education and local school districts. In the light of criteria endorsed by authorities in the field, most are deficient. To cite here only three among these criteria and to contrast the realities: In their writing, speeches, testimony to Congressional committees, and elsewhere, these authorities concur that environmentalism should be worked into every subject in the curriculum--science, social studies, the arts, mathematics, English, everything. Few of the programs reported to Education U.S.A. do so. (The NEA found that most programs reported in its survey focus on science or applied science.)

These authorities concur also that environmental education should be part of the school program from kindergarten through high school. Education U.S.A. found this to be only rarely the case (as did the NEA, which said most programs center on the upper elementary grades). And, it is the consensus that environmental education should operate throughout the entire school year, with some summer experience outdoors if possible. Neither Education U.S.A. nor the NEA (which reported that "only one-fourth of the programs it surveyed operate all year) found this to be true in most instances.

Nevertheless, there are good and comprehensive programs, statewide and local. With passage of the Environmental Education Act, authorizing federal support for a wide variety of activities, there is hope that there will soon be many more.

TABLE OF CONTENTS

Overview 1
Environmentalism: A New Perspective 2
The Environmental Education Act 6
Environmental Education and the States 9
Environmental Education in School Districts 21
Higher Education 36
Nationwide Programs of Environmental Education 40
Appendix 43

ENVIRONMENTALISM: A NEW PERSPECTIVE

On April 22, 1970, millions of Americans dropped everything for an hour or several hours to take part in one of the most impressive mass demonstrations the country has ever known: Earth Day.

Earth Day--Environmental Teach-In was another name for it--was the brainchild of Sen. Gaylord Nelson (D-Wis.), sponsor in the Senate of the Environmental Education Act. Senator Nelson had long been alarmed at the way mankind was destroying his natural resources, polluting his air and water, befouling his cities, and desecrating his shrinking acreage of forest, mountain, and plain. He saw Earth Day as an occasion for all Americans to express their own alarm.

Exactly how many citizens cheered how many speakers at how many rallies across the land on April 22, 1970, will never really be known. Denis Hayes, national coordinator of Environmental Action, the group of mostly young people who took Senator Nelson's idea and ran with it to organize the Day, estimated that they numbered in the millions, and this seems reasonable.

Something else that will never really be known is how many of the Americans who turned out on Earth Day really understood what it was all about and how many missed the point entirely. Some certainly missed the point. Michael Silfen, a student at the Bronx High School of Science in New York City, is one who can testify to that. Silfen was a witness at a hearing on the newly enacted Environmental Education Act conducted in New York City on April 24 by the House Select Subcommittee on Education, chaired by Rep. John Brademas (D-Ind.). At one point he told Rep. James H. Scheuer (D-N.Y.), a member of the Subcommittee, that "I was down there on 14th Street," where New York's Earth Day rally had been staged two days earlier. The hearing transcript continues:

> Mr. Scheuer: Were you one of the fellows who left all those paper plates and cups there?
>
> Mr. Silfen: No.
>
> Mr. Scheuer: I am glad to hear it. A lot of those demonstrators were environmental polluters in their own right.
>
> Mr. Silfen: Well, some groups of people walked on Fifth Avenue and dumped garbage right in the middle of it. I got the impression that everybody seems to be aware of the problem but nobody knows what to do about it.

Michael Silfen's impression was echoed in many another quarter as the excitement of Earth Day began to wane. Frederick Sargent II, dean of the College of Environmental Sciences, U. of Wisconsin-Green Bay, had this to say in the weekly Chronicle of Higher Education: "There is a real danger that the environmental teach-in is the students' 'thing' this year. ...Only sustained work will lead to the solution of environmental problems. Highlighting problems by burying cars and removing litter from ditches will not accomplish anything in the long run."

Warren Bryan Martin, research specialist at the Center for Research and Development in Higher Education, Berkeley, Calif., seconded Sargent's views, also in the Chronicle: "The teach-in will not change things unless it raises the question--clean air, pure water, good earth: for what?"

John DeLury, president of the New York City Uniformed Sanitationmen's Assn., came quickly to the point in testimony before the Brademas Subcommittee. DeLury conceded that environmental protection is a money problem. But more than that, he said, it is a people problem, and this means it is an education problem. "People," he said, "not some impersonal corporation, are the street litterers. People abandon their cars and scatter garbage on the city streets. If this pollution can be curbed at the source, then our city will be cleaner and the nation's cities will be cleaner."

Then, boiling down to a salty residue the thousands of elegant words spoken and written on the subject by educators, politicians, clergymen, and editorial writers, DeLury came down with: "No one-shot gimmicks, but sustained effort and constant education are needed."

Many others expressed doubts about the long-haul effectiveness of Earth Day. Few who expressed such doubts, however, would disagree with William D. McElroy, director of the National Science Foundation, who reflected in the Chronicle: "We may have run the risk of emphasizing the superficial during the teach-ins.... I am quite prepared to accept this danger in order to dramatize the point."

"Dramatize the point," Earth Day and the build-up toward it certainly did, and one of the most striking results was to spur environmental education, from kindergarten through adult education. There is no question that the Earth Day furor helped the Environmental Education Act through Congress and new state laws through legislatures, or that it stimulated local school districts into developing their own programs.

For, while many had seen Earth Day merely as pointing up a need for new laws to control pollution or to penalize corporate and private polluters of air and water, or a need to plant more trees or to save the birds, many others had long seen just what DeLury had seen--a need for environmental education.

To be fair, some states and many local school systems had long ago sensed the importance of environmental education and had acted. Many of these earlier state and local programs, like many of the newer ones, reflected a genuine understanding of environmental education, but many reflected only a vague and not very well resolved feeling that "we ought to do something about it." Some amounted to little more than nature study beefed up with a trip

to the zoo. Others were little more than instruction in the conservation of natural resources, which in farming country might address itself only to soil conservation, and in a lumbering state only to forest conservation, etc. Some so-called environmental education carried the title "outdoor education," and this might mean only training in campership.

So, what is environmental education? Rather, first of all, what is environmentalism, the thing that this education is supposed to be about? Clay Schoenfeld, chairman of the Center for Environmental Communications and Education Studies at the U. of Wisconsin-Madison, brought this into focus in his testimony before the Brademas Subcommittee.

Discussing the difference between what he called "the old conservation" and "the new environmentalism," Schoenfeld said: "In terms of its scope, the new environmentalism attempts to be all-encompassing. Whereas yesterday we tended to treat soil conservation, water conservation, forest conservation, wildlife conservation, and so on, as separate units, today we try to understand and explain the ecological unity of all man-land relationships.

"In terms of its focus, then, the new environmentalism is man-centered. That is, our primary concern has shifted from the survival of remnant redwoods and raptors to the survival of nothing less than the human species itself.... In terms of its locus, while the old conservation conjured up images of open country, the new environmentalism incorporates the pressing problems of the city. In terms of its emotional underpinnings, the new environmentalism is based more on fear for man's tomorrow than on a love for nature's yesterday.... In terms of its political alliances, the old conservation was linked to such orthodox causes as depression pump-priming, national defense, and outdoor recreation; the new environmentalism, on the other hand, encompasses demands for population control."

So, again, what is environmental education? On what philosophy is it based? What are its goals? At its best, what approach does it take? With respect to philosophy, a guide for elementary school teachers developed by the Nevada State Dept. of Education puts it succinctly: "The principal feature of the philosophy of environmental education is that man is an integral part of a system from which he cannot be separated."

"We need in our schools," former HEW Secy. Robert H. Finch told the National Assn. of Secondary School Principals in a February 1970 address, "to counteract the idea of environment as being something 'out there' that can be visited and then left behind at the end of the field trip. Our goal must be to see that every school has access to an environmental study area where youngsters of all ages can grow up with the concept of environment as being everything that makes up their world, and with an understanding of the interdependency of all its numberless elements."

Reflecting on all this, William C. Everhart, assistant director of the National Park Service, has concluded: "Perhaps the most urgent task facing us today is the development of an environmental ethic."

And what approach does environmental education take at its best? For one thing, certainly, at its best it takes a realistic approach, recognizing

that technology is here to stay and that the best that education can do is to teach people to use it intelligently.

Lee A. DuBridge, former science advisor to President Nixon, put it this way in February 1970 in a major address to the American Assn. of School Administrators: "...The very act of living in an industrialized society such as ours constitutes a contribution to the using up of resources and the creation of waste materials.... Obviously, we never can be perfect in our methods of treatment, and so a certain amount of pollution is absolutely inevitable. The question is, I repeat, how to get the pollution down to reasonably harmless and unobjectionable levels."

In more folksy terms, ecologist Philip Wylie told a conference conducted in the spring of 1970 by the Institute for Development of Educational Activities, Inc. (IDEA): "All we can do is try to diminish the amount of clobbering he [mankind] is going to have to take...."

DuBridge, projecting ways in which schools might pursue environmental education within the framework of realism he had imposed, continued: "Yes, technology does convert natural materials into usable materials and in the process produces waste products. But does anyone seriously want to return to the Middle Ages, before the days of modern technology...?

"Here, students might be encouraged to study a little social history, might be invited to write down the ways in which the average American citizen has a far better life than, say, the citizen of India or even of Europe in the Middle Ages."

The thrust of DuBridge's suggestion--that environmental education should bring in the social sciences, humanities, and other studies as well as biological and physical sciences--is a thrust found in the thinking of all leading authorities on the subject. Moreover, all who have made serious study of environmental education are unanimous in maintaining that it should span the entire academic career, from kindergarten through high school and college --and then into adult education.

The Editors of Education U.S.A. asked the education departments of all states what they were doing or had done to set up curricular guidelines in conservation education for use throughout the state. At the same time they asked the state departments to list local school districts that they felt were doing an outstanding job in conservation education as a result of state initiatives, or on their own. These referrals were followed up.

To say that the survey uncovered a nationwide picture of real understanding of environmental education and of widespread programs integrating it into the curriculum from kindergarten on up would be more than a slight exaggeration. In truth, understanding is still lacking for the most part, and integrated programs reflecting such understanding are relatively few.

Nevertheless, there is understanding in many places. There are many good programs. And the Education U.S.A. survey uncovered other promising programs being drawn up, with the expectation that they will be put into action in a year or so.

THE ENVIRONMENTAL EDUCATION ACT

The Environmental Education Act, which became law when President Nixon signed it on Oct. 30, 1970, will unquestionably go down as a major milestone for environmental education. While only $2 million in start-up funds were apprcpriated for it in the fiscal year ending June 30, 1971, progressively higher amounts were authorized in future years. With the U.S. Office of Education (USOE) placing a top priority on environmental education, it was hoped that the wide variety of programs the Act created would soon be put into action. (To obtain the complete text of the Environmental Education Act--Public Law 91-516--please write to your Congressman.)

Here is a summary of the Act prepared by USOE:

GENERAL PROVISIONS AND CRITERIA FOR ELIGIBILITY

Support for environmental education for all age groups. Environmental education is generally interdisciplinary and includes all factors relating to environmental problems--the study of manmade and natural environment--and is concerned with total human environment.

A. Program Provisions

Grants and contracts may be awarded to:

1. Institutions of higher education.
2. State and local educational agencies.
3. Regional educational research organizations.
4. Other nonprofit public and private agencies, organizations, and institutions (including libraries and museums).

For such activities as:

1. Curriculum development--including interdisciplinary curricula.
2. Dissemination of information relating to curriculum and environmental education generally.
3. Support of environmental education programs at the elementary and secondary education levels through grants to state and local educational agencies.
4. Preservice and inservice training programs and projects (including fellowship programs, institutes, workshops, symposiums, and seminars) for:

   a. Educational personnel.

b. Public service personnel.
c. Government employees.
d. Business, labor, and industrial leaders and employees.

5. Planning outdoor ecological study centers.
6. Community education programs, including special programs for adults.
7. Preparation and distribution of materials for use by the mass media.

In addition, provision is made for:

1. The award of small grants (not to exceed $10,000) to nonprofit organizations such as citizen groups, volunteer organizations, and other public and private nonprofit agencies, institutions, or organizations for:

   a. Courses.
   b. Workshops.
   c. Seminars.
   d. Symposiums.
   e. Institutes.
   f. Conferences.

   The small grant provision stresses support of activities for adults and community groups (other than the group funded).

2. A technical assistance program for:

   a. Local educational agencies.
   b. Public and private nonprofit organizations.
   c. Institutions of higher education.
   d. Local, state, and federal government agencies.
   e. Other agencies deemed appropriate by the Secretary of Health, Education, and Welfare to enable them to carry on education programs related to environmental quality. Such assistance shall be rendered by the Secretary upon request and to the extent practicable.

B. Administrative Provisions

The Act provides for:

1. The establishment of an office in USOE to administer programs under the Act and to coordinate other related activities in the agency.
2. A national Advisory Council on Environmental Education.
3. The utilization by the Commissioner of Education of the services and facilities of any public or private agency or institution in accordance with appropriate agreements, and to pay for such services either in advance or by way of reimbursement.

C. General Eligibility Criteria

The groups listed in Part A may be eligible for program funds under the Act if they:

1. Are nonprofit (for grants).
2. Have been in existence at least one year prior to application.
3. Are proposing activities which are nonpolitical and would support the purposes of activities specified in the Act.
4. Will carry out or supervise the activities proposed.
5. Will provide funds from other sources to help support the activities proposed. (Federal funds may not exceed 80% of the cost in the first year, 60% in the second year, and 40% in the third year, except in the case of curriculum development, dissemination, evaluation, and small grant projects.)
6. Have established policies and procedures that will assure adequate evaluation of the activities and proper accounting and disbursement of the federal funds.
7. Have, in the case of local educational agencies, submitted their applications to the state educational agencies for review.

D. Priority areas as reflected in Congressional reports:

1. Multidisciplinary curricula, programs, projects for all age groups.
2. Dissemination of information.
3. Testing, evaluation, and demonstration of activities and materials.
4. Inservice teacher training.
5. Community education, especially for adults and with broad-based community representation.
6. Training of noneducation personnel.

Environmental Education for 1980 . . . And 1990

Those who have thought most about environmental education realize that it is not just for today but for tomorrow and next year and every year from now on. Here is what two witnesses before the Brademas Subcommittee had to say about this:

Robert H. Finch, former Secretary of Health, Education, and Welfare: "The teacher we intend to send into our public schools in 1980 is today a sixth grader somewhere in America. He or she must be taught--beginning right now--along with every other American boy or girl, about environmental quality, about ecology....

"When we turn these brand new teachers loose in 1980 they must know much more than any of us do right now about the problems involved in human survival--or else the war may well be lost, although the battles may go on for a few decades longer."

Neil Fabricant, General Counsel, New York City Environmental Protection Administration: "We must build a constituency for the future, a constituency that...will expect government and industry to ...provide a livable urban environment--and we have to begin in the public schools. We cannot afford to produce judges 20 years from now who view pollution as some kind of minor white collar crime that doesn't deserve the kind of sanction we feel should be imposed...."

ENVIRONMENTAL EDUCATION AND THE STATES

Almost every state has given some sort of recognition and encouragement to environmental education. Whether long-standing or inspired by the excitement that also inspired Earth Day, however, state approaches vary widely. In some states the legislature has passed a law directing in the most general terms that local schools provide for environmental education. In others the legislature has mandated a statewide, comprehensive program of environmental education, perhaps even establishing a new division in the state department of education to carry it out. (Unhappily, especially if such action was taken during the Earth Day excitement, some legislatures failed to appropriate funds for the program.)

Some state departments of education have mounted environmental education programs administratively, within existing authority. Whatever the approach, state programs vary widely in breadth and depth. While some are K-12, others are aimed at only one or a few grades. While some capture the real meaning of environmental education, others verge on "outdoor education" that is hardly more than nature study or campership. Others center on conservation of natural resources, which is somewhat short of the mark, too. Some of the state programs that emerged from the Education U.S.A. survey as representative of the most comprehensive and best conceived--although not necessarily the only good ones--are described below.

New Jersey: A Long-Time Leader

New Jersey has been a leader in conservation education since 1949, when it established the New Jersey State School of Conservation. All New Jersey state colleges have required their students to attend the school for one week. The school is winterized and accommodates some 250 college, elementary, and secondary students each week.

Rutgers, through its recently reorganized College of Environmental Science, has stressed research and specialized undergraduate study in addition to conducting inservice workshops for teachers.

Two of New Jersey's state colleges--Glassboro and Montclair--established master of arts programs in environmental education with the help of more than $500,000 in initial funding provided by the federal government under the Education Professions Development Act (EPDA). Some 40 students earned the degree as EPDA fellows supported under this initial funding. In the 1969-70 academic year, 70 students were pursuing it under a nonfederally supported program.

In 1967, with funds made available through Title III of the federal Elementary and Secondary Education Act, the New Jersey State Council for Environmental Education was established at Mountain Lakes, with Edward J. Ambry as director. A statewide planning and research project, the Council operates under a grant to the Newark Board of Education. It was designed to: (1) assess Title III environmental education projects in New Jersey, (2) inventory all environmental education projects and sites within the state, (3) determine how inner-city youth may best be served by environmental education, (4) create an awareness of the value of environmental education within the general public, (5) develop an evaluation instrument for environmental education programs, and (6) design a statewide master plan for environmental education. All of these objectives have been realized.

Since its Board of Directors represents 13 interest groups in the state, including professional educators as well as state government department representatives, the Council is sensitive to divergent viewpoints and can quickly respond to New Jersey's educational needs. The Council also maintains communication among three local Title III environmental education projects, 200 other local projects, representing more than one-third of the school districts in the state, and local conservation interest groups.

The three local Title III projects are:

- The Conservation and Environmental Science Center at Browns Mills, operated by the Glassboro School District.
- The Shore and Marine Environmental Program conducted by the Middletown Township School System at its Science Interpretive Center, Sandy Hook State Park, Atlantic Highlands.
- The Stepping Stone Environmental Education Center in Stokes State Forest, sponsored by the Carteret School District.

The Browns Mills Center now conducts day, resident, and teacher inservice programs on a temporary site in an abandoned cranberry bog. It is open to school districts throughout the state on a fee basis. The discovery approach to learning underlies all center programs. Learning experiences have been developed for primary, intermediate, upper elementary, junior high, and secondary grade levels in several curriculum areas including science, social science, art, and language arts. The staff has developed a series of curriculum guides in these areas. Although the center philosophy calls for teachers to use the out-of-doors for that which can best be learned there, the classroom is not ignored. The curriculum guides incorporate classroom procedures designed to initiate, supplement, and reinforce direct observation and learning about the environment.

Plans are now under way to develop a permanent center at Whitesbog, an old company town within the cranberry bog, which will permit environmental education programs to expand to include local industry. A major objective of this center is to promote an alliance of local industry, education, and state and federal governments in order to study environmental problems in depth and disseminate results of those studies to the citizens of New Jersey.

The Sandy Hook Center is available to all elementary and secondary schoolchildren of Middletown Township and to students of Brookdale Community

College. Although most of the offerings are science oriented, provision is made for language arts, mathematics, art, and social studies as well. The science offerings, which make use of the marine environment of Sandy Hook, include geology, land and marine biology, ecology, and pollution. Ample laboratory equipment, well developed field programs, a well qualified staff, and wilderness study areas--including salt marshes, ocean-bay estuaries, and a holly forest--insure a rich student experience. Sandy Hook has no resident facilities. Students visit on three successive days, arriving at 9 a.m. and leaving for their school at 2 p.m. Work on a self-guided trail for handicapped children was begun in 1970. Teachers from outside Middletown Township may observe activities at the center and adopt techniques and material for use with their classes.

Stepping Stone operates both resident and day-use programs throughout the school year and is open on a subscription basis to all New Jersey school districts. The dormitories, dining hall, library, field science laboratory, museum, and arts and crafts center are completely winterized and can accommodate classes of up to 70 persons. Before arriving at Stepping Stone, a class and its teacher have a planning session with a staff member from the center. The teachers are supplied with worksheets and supplementary material.

In residence, the students are actively involved in subject matter through exposure to real-life learning situations, which cannot be duplicated in the classroom or community. The staff, composed of professional environmental educators, also conducts school-site studies at the request of individual school districts, as well as teacher training workshops and inservice programs. The school-site studies utilize the school grounds and adjacent areas to vitalize classroom learning.

Non-Title III facilities in New Jersey afford a diversity of programs and illustrate the coordinating effect of the State Council. The Thunder Mountain Camp in the Tocks Island National Recreational Area, for example, is utilized by the Newton Board of Education for special vocational education and recreation programs and is available for use on a subscription basis by other school districts.

The Trenton Action Bound School Within a School, originally funded under Title III, now draws support from its three neighboring districts of Lawrence, Ewing, and Hamilton townships; Lawrenceville Preparatory School; and the Ford Foundation. A regional environmental education program is being developed.

The Union County Environmental Education Center, also originally funded under Title III through the Linden Board of Education, has come under the aegis of the Union County Educational Services Commission and is supported by 17 of the 21 Union County districts. Located on a 2,000-acre tract, the center can accommodate pupils on a daily basis.

Two steps were taken in 1970 to put into effect the statewide master plan developed by the State Council for Environmental Education. An Environmental Quality Education Act, calling for state support for research, curriculum materials, outdoor centers, and other activities recommended in the plan, was introduced in the legislature. And the plan itself was submitted to the U.S. Office of Education with a request for funding.

Pennsylvania: In the Spirit of Gifford Pinchot

Since the days of Gifford Pinchot, the conservationist who served as governor in the 1920's and again in the 1930's, Pennsylvania has paid considerable attention to environmental education. By 1970 its schools had about 90 outdoor education programs, 135 outdoor laboratories, and 450 schoolground activities, many funded under Title I or III of the Elementary and Secondary Education Act of 1965 (ESEA).

On July 1, 1969, the State Board of Education directed that every school require conservation and outdoor education. That fall the State Dept. of Education initiated an environmental education project for elementary schools, conducting eight regional orientation sessions. In the spring of 1970 it ran leadership training conferences for 27 school districts. By the fall of 1970 the Department had initiated a similar developmental program for secondary schools and introduced the National Environmental Education Development (NEED) curriculum developed by the National Park Service at all levels--from kindergarten through 12th grade. (For more about NEED see page 40.)

Twenty-seven school districts are to participate in an evaluation of NEED at the elementary level and 30 districts at the secondary level. Meanwhile, the Department is proceeding with its own curricular design studies, continuing with summer workshops for teachers in environmental education, planning TV films, and conducting a variety of other projects.

One of the more exciting activities in this state is the Pennsylvania Outdoor Education Resources Center, headquartered at Pennsylvania State U.'s College of Health, Physical Education, and Recreation. The center began with Title III, ESEA, support as the Central Pennsylvania Outdoor Education Project, serving four counties. By 1969 the Project had grown to include 27 counties and was serving 3,300 teachers with materials and inservice training and exposing their pupils to an outdoors entirely new to many of them.

In 1969 the Pennsylvania State Dept. of Education, Penn State, and the board of education of Centre County, where the university is located, cooperated to expand the Project into the Pennsylvania Outdoor Education Resources Center, which offers services to schools all over the state. The center conducts teacher inservice programs of two hours to two days. The programs are devoted to various facets of conservation and outdoor education, emphasizing how they may be integrated into existing curriculums in mathematics, language arts, natural science, social studies, music, arts, and physical education.

The center also publishes some instructional materials, directions for making simple scientific equipment, and the like. One engaging example, especially illustrative of the brass-tacks approach found throughout the center's program, is "The One Ten-Thousandth of an Acre Hoop." The hoop, made of clothesline wire, is 88 3/4 inches in circumference, divided into four quadrants with twine. (Formulas for calculating that a hoop this size will enclose 1/10,000 of an acre are included so that students old enough to tackle them may do so.)

Students are grouped by fives. Each group tosses its hoop at random on the school grounds or in a park. Then, with one student assigned to each

quadrant and one acting as recorder, the group observes what is bounded by its hoop. The publication suggests various ways the hoop may be used to serve the purposes of ecology, mathematics, language arts, and conservation study. For example, in connection with ecology, one 1/10,000 acre might have more earthworms than another. Why? To advance their mathematical understanding, students might tally the number of living things they found inside their hoop and project the number in an acre, and so on.

The Resources Center also coordinates schedule and staffing of five-day resident outdoor education programs at the Stone Valley Recreation Area, owned by Penn State. The cost for one of these sessions is $25 per pupil for room, board, insurance, and nursing service. Any teacher in the state may reserve a week.

South Carolina: Home of 'People and Their Environment'

South Carolina is proud that the eight-volume set of curriculum guides called "People and Their Environment" was developed there. The guides began as an activity of the South Carolina Conservation Curriculum Improvement Project, of which Albert H. H. Dorsey, chief of the Curriculum Development Section of the State Dept. of Education, was coordinator. The project team consisted of South Carolina teachers, staff members of the state's Advisory Council for Conservation Education, specialists from federal agencies, South Carolina State Dept. of Education personnel, and members of the school of education of the state university. Paul F. Brandwein and Matthew J. Brennan of the Pinchot Institute for Conservation Studies served as consultants.

Over a period of four years before the series was finally published in 1969 (J. G. Ferguson Publishing Co., Chicago), the team wrote, reviewed, and rewrote the more than 400 lessons in the series, subjected them to tests by some 2,000 teachers, and submitted them to review by departments of education in all 50 states. South Carolina now has made the guides available to all its 93 school districts. (The publisher claimed in 1970 that they were in use in 72,000 classrooms in the country. Massachusetts was developing its own set of guides based on the South Carolina series.)

The series covers eight areas of K-12 education:

- Grades 1-3 (56 lessons).
- Grades 4-6 (80 lessons).
- Science in grades 7-9 (68 lessons).
- Social studies in grades 7-9 (64 lessons).

- Social studies in grades 10-12 (54 lessons).
- Home economics in grades 9-12 (74 lessons).
- Outdoor laboratory study in all grades (56 lessons).
- Biology in all grades (43 lessons).

Step by careful step, the lessons progress from such easily graspable topics as "Plants for Food" and "Good Habits Out of Doors," in the grades 1-3 guide, to "Development of Modern Israel" and "People as a Resource" in the grades 10-12 social studies guide.

Minnesota: Pilot Curriculum Being Tested

In March of 1969 the Minnesota legislature rewarded years of effort on the part of the state's environmentalists by passing this law: "The State Dept. of Education with the cooperation of the Dept. of Conservation shall prepare an interdisciplinary program of instruction for elementary and secondary schools in the field of environmental conservation education. The program shall provide integrated approaches to environmental management consistent with socio-ecological principles, the production of appropriate curriculum materials, and implementation in the public schools in the state." Unhappily, but not untypically as far as state legislatures are concerned, the Minnesota legislature went home without appropriating any money to carry out the new program, but other funds were found, and the two departments went to work.

The first step was to set up the Minnesota Environmental Education Steering Committee, with four members from each department and two more members from the Dept. of Education, ex officio. The Minnesota State Advisory Task Force, representing education, industry, federal, state, and local governments, and public and private organizations and agencies, was formed to assist the Steering Committee with its assigned task of directing the structure, development, and implementation of a statewide environmental education program. Three other task forces, on communications, inservice training, and research and development of curriculum, were named later.

The Steering Committee decided to develop a pilot curriculum in time for it to be tested by a few volunteer school districts in the fall 1970 term. It contracted with Minnesota's Environmental Science Center to develop curriculum materials during the summer with measurement and evaluation procedures built into them. The Environmental Science Center, originally established with an ESEA Title III grant in 1967, had not only been working on such materials but had also been developing training programs for teachers, school administrators, and youth and adult group leaders, identifying and promoting the development of natural areas and other community resources as learning laboratories, and pushing for programs of community education in environmental quality and ecological balance.

While the center was at work on the curriculum, the Steering Committee went ahead lining up test schools. It invited inquiries, and 60 districts expressed interest. To them the Committee sent a form letter outlining responsibilities of various groups and individuals as follows:

<u>State Departments of Conservation and Education</u>

1. Financial assistance to the participating school district.
2. Training programs.
3. Evaluation of the program.

<u>Local School Board and Administration</u>

1. Official school board approval and endorsement (of the pilot program) with the option to be released from commitment by request.
2. Financial assistance at the rate of $100 per participating instructor.
3. Total K-12 program involvement.
4. Providing adequate inservice time for workshops and planning.
5. Stimulating community integration and communication.

Local Coordinator

1. Attending summer curriculum development workshop.
2. Leadership training colloquium participation.
3. Responsibility for local school district inservice training workshop.
4. Liaison services with trial teachers and State Depts. of Conservation and Education.
5. Coordination of evaluation program.
6. Responsibility for the pilot program.

Trial Teacher

1. Attendance at inservice training workshops.
2. Trial teaching of designated pilot units.
3. Measurement and evaluation of pilot units.
4. Recommendations or revisions of pilot units.

In the end 35 districts applied to participate in the program, and 12 were chosen as representing a cross section as to size, location, etc. Curriculum workshops for teachers in the pilot schools and schools cooperating with them were held in October 1970. Actual instruction began immediately afterwards.

John Miller, chairman of the Steering Committee and environmental education consultant for the State Dept. of Education, gave the underlying philosophy of the project: "We are concerned that a student be better prepared to face his environment...that he will have confidence, based on knowledge, to make the proper decisions regarding his relationship with his environment. It is not enough that a student learn to be aware of and appreciate the world around him. He must also learn to be concerned and responsible for his world."

The lesson packages reflect this concern. The writers urge that the first question the teacher ask about a lesson be: "Is this unit a real-life experience of concern to students?" The teaching manuals emphasize that facts are subordinate to reasoning processes and to the ability to apply facts to real situations. The content of the lessons may apply to a variety of subjects rather than being oriented to particular subject areas. Skills of reasoning and observation will be the most important thing learned by kindergartners as they study, for example, the behavior of guppies. The whole approach, as Miller sees it, is to develop a social and political conscience in the individual. "Students must seek to affect their environment positively through legislation, political action, and their behavior as consumers," he said. "After all, we will have problems with disposable bottles until the consumer refuses to buy them."

California: An Environmental Conscience

In 1963 the California legislature enacted Section 5205 of the state education code: "March 7 of each year, the anniversary of the birthday of Luther Burbank, is set apart and designated Conservation, Bird, and Arbor Day. All public schools and educational institutions shall observe Conservation, Bird, and Arbor Day not as a holiday, but by including in the school work of the day suitable exercises having for their object instruction as to the economic value of birds and trees, and the promotion of a spirit of

protection toward them, and as to the economic value of natural resources, and the desirability of their conservation." Until 1968, that remained California's only statewide legal requirement for education in the environmental area.

The California State Dept. of Education and the California Resources Agency offered limited assistance to local school districts that wished to set up environmental education programs, and some districts developed rather good ones. Rudolph J. H. Schafer, the Department's consultant in conservation education, writing in the May 1970 issue of the CTA Journal (published by the California Teachers Assn.), cited as examples a week-long resident outdoor program for sixth graders, established in 1948 by the San Diego city and county schools, and similar programs conducted by Long Beach and Los Angeles schools. "Most districts included some conservation education in the fourth-grade California social studies unit," Schafer continued. "The overall picture, however, was not too encouraging."

What happened in the legislature in 1968 changed "the picture" to one at least somewhat more encouraging. The story of what occurred then began two years earlier, when a committee of the state senate held hearings on "A Program of Conservation Education for the Department of Education." The outcome was a recommendation that the Department exert more effective leadership in developing conservation education programs.

In May 1967, in response to the senate committee's wishes, the State Board of Education named an Advisory Committee on Conservation Education to develop recommendations to meet the needs pointed out by the committee. To insure the essential public support, the Advisory Committee included representatives of elementary, secondary, and higher education; the U.S. Forest Service; the lumbering, agricultural, and recreational industries; and citizen organizations. The Dept. of Education obtained funds through Title V of the Elementary and Secondary Education Act to support the work of the Committee and to establish the position filled by Schafer, that of conservation education consultant.

As a first priority, while undertaking other tasks at a more deliberate pace, the Committee threw its support behind legislative proposals that would mandate broad principles for conservation education and set up the machinery to carry them out. And, in 1968, the legislature passed a series of laws along these lines. Conservation, Bird, and Arbor Day remained on the books, but now, instead of pausing for just one day per year to consider "the economic value of birds and trees," every elementary and secondary school pupil in the state was to consider conservation every day of the school year. And not only birds and trees, for the new laws, specifying amendments to the social sciences curriculum at all levels, contained this significantly broader language: "Instruction shall provide a foundation for understanding...man's relations to his human and natural environment." What this meant was that the legislature, understanding the limitations of the conservation and nature study approaches, had armed the Department with authority to cover the whole range of environmental education in its best sense.

The 1968 legislature also created a Conservation Education Service in the State Dept. of Education and authorized grants by the Department to help

school districts plan and set up programs meeting their own local needs. What made the 1968 legislature's action only somewhat more encouraging was that, while its members grasped the importance of environmental education, they unfortunately did not grasp the importance of funding it. A bill to appropriate $125,000 for the program was introduced in 1969 but died in the senate finance committee. In 1970, it was expected that $176,000 would be provided by the governor's office, but this did not materialize. The Department applied for another ESEA Title V grant, and $139,000 was awarded. At the same time the state did earmark up to $37,000 of receipts from a surcharge imposed for personalized auto license plates (bearing the owner's initials, for instance) for environmental education. If these receipts reached $37,000, total funding of the program would reach the $176,000 expected earlier.

By the fall of 1970 California was off and running, developing a curriculum to put into action an environmental education master plan which the Advisory Committee had--in October 1969, after nearly 2 1/2 years' work--submitted to the State Board, and which the Board had adopted. Running some 60 pages, the master plan included a basic conservation-environmental education philosophy and recommendations on local school programs; on teacher training; on the role of governmental agencies, private conservation groups, and business and industry in supplying conservation teaching materials; and on the role of the Department. Supplementary reports were made covering free and inexpensive printed and audiovisual teaching materials, teacher training courses offered by the state's colleges and universities, and the use of state-adopted textbooks in local school programs. The Department planned to publish the guides to free audiovisual and printed materials for distribution to schools, expanding and updating them from time to time.

The basic need, as the Committee saw it, was for a public with an environmental conscience--"aware of the values and choices and sensitive to the needs of generations yet to come." The Committee held that environmental education woven into the total fabric of the public school curriculum is the key to developing such a conscience. In outlining a program for the schools, the Committee recognized that environmental protection is social action which should be based on scientific and technical knowledge. In summary, it expressed the view that such a program should include instruction in these specific areas: (1) Basic Ecology--how the environment operates, and how man relates to it and interacts with it; (2) Resources and Environmental Technology--how man, through his technical skills, protects and enhances his environment and uses its resources wisely; and (3) Social Processes--how man's attitudes and policies toward the environment and its resources are formed, modified, and changed.

The Committee held it essential also that the program be related to a child's immediate environment and that it include opportunities for personal involvement and direct action. "One reason the public feels that 'someone else' is responsible for conservation and environmental education," Schafer said, "is that schools in the past have largely neglected this factor of personal involvement and social action and have conducted instead programs which offer little more than nature study. For most Californians 'immediate environment' means an urban or suburban area. It makes little sense, therefore, to conduct programs in such areas which emphasize the good works of Smokey the Bear and Farmer Brown and ignore urban life and its environmental problems."

The program envisioned by the Committee would provide opportunities for children to observe and study their environment at close range. Outdoor natural study areas at each school were recommended. Field trips to observe natural phenomena, environmental problem areas, and the various social processes of conservation were suggested, and the legislature was requested to provide funding specifically for such trips. Resident outdoor school programs throughout the state were recommended too. Governmental agencies and large corporations owning land were urged to make part of their holdings available to schools for this purpose. The legislature was urged to make low-interest state loans available to school districts to build needed facilities.

In the classroom, science and social science will be the major areas in which instruction is provided as part of the regular environmental education program, but the Committee recommended that arts and humanities, home economics, language arts, and others having environmental teaching possibilities be pursued. A summary course in the secondary school program was recommended as a way to reemphasize concepts gained in lower grades.

The Committee recommended that the legislature provide funds for large-scale inservice training for teachers throughout the state. It developed a model course suitable for inservice or preservice training, and this was sent to all colleges in the state certified for teacher training. Noting the importance of good teaching materials and equipment as well as trained teachers, the Committee urged the state curriculum commission to push the environmental emphasis as appropriate in future textbook adoptions. It also recommended that the Department offer assistance to producers of educational materials in the area of environmental and conservation education. This would include commercial producers as well as public and private nonprofit agencies. A writers workshop to bring educators and authors together was suggested as another project for the Department. Throughout the Committee's deliberations, representatives of citizen conservation groups, business, industry, and government were on hand to offer advice and assistance. A permanent statewide advisory committee was another of the Committee's recommendations.

Washington: A Regional Approach

While some states develop environmental education pilot projects in a few districts, and others "shoot the works" statewide, the state of Washington has taken a third route. It is a regional approach in which 21 school districts in five northwest Washington counties and part of a sixth, together with Western Washington State College and the State Dept. of Natural Resources, cooperate in what is expected to be a model for the entire state.

These partners in 1958 established the Northwest Environmental Education Center, headquartered on the Western Washington State College campus at Bellingham. For the first 10 years or so of its life the center proceeded rather modestly. It developed some curricular materials, conducted inservice teacher training, carried on community "missionary" work in environmentalism. It also operated, on a day basis, an outdoor education laboratory on Whidbey Island, in Puget Sound. Its activities, while aggressive, came only to about as much as might be expected in view of the limited public interest in environmental education nationwide during that period.

Then several things happened. In 1969, with initial financial support from the office of the state land commissioner, the Dept. of Public Instruction appointed an environmental education supervisor--the first such appointment, it claimed, in the United States. In December of the same year the school board of Sedro Woolley, one of the 21 districts cooperating in the center, directed a dramatic reorganization of curriculum to make environmental education a part of all learning activities.

Other signs of rising interest in environmental education appeared. But the big push came in February 1970 when the state legislature appropriated $140,000 toward two environmental education projects. Of this sum, $50,000 was to go to the center for curriculum planning and for development of a residential center on Whidbey Island. The remaining $90,000 was to be used to reopen a former Job Corps camp at Cispus, in southwest Washington, and to operate it for a year as an outdoor laboratory.

A Seattle newspaper columnist described the legislature's action as its "greatest contribution"--not to environmental education--but to "environmental protection." In explaining this view, he noted that, while certain other pieces of legislation in the environmental area had passed easily enough, a bill calling for state zoning as a means of controlling the use of salt water shorelands had failed. The bill, with its zoning feature, he said, was so complicated that neither the public nor most of the legislature understood it --and in any case "the public could not understand the urgency for action now." Asking "why should the adult public understand these things?," the columnist answered himself by recalling that when today's adults were in school they learned little or nothing about zoning, about the pressures of population on shorelands, about new solutions to the problems created by a growing society. That, he continued, is no reason for another generation to grow up in the same ignorance, and that, he concluded, "is why that small appropriation for those two outdoor laboratories was so important."

Others evidently thought it was important too, and that the effort it supported was worth further support. Within a few months local foundations and industry had contributed $30,000 to develop such things as a water system at the 600-acre Whidbey Island site and to provide scholarships for some initial inservice teacher training. The U.S. Office of Education awarded the center $67,000 to develop and field test a pilot environmental education program in the Sedro Woolley district. Part of the district's plan is that a nine-member team will travel throughout the northwest region--and throughout the rest of the state as well--to help other schools set up programs.

The center, faced with the impossibility of running the 120,000 students and 4,500 teachers in the northwest region through the Whidbey Island program in any one year, decided to concentrate at first on training a small number of specialists who would return to their home district and set up programs to train more specialists. The center estimated that by June 1973 every one of the 21 districts, and most schools within each district, will have a specialist on their staff. Eventually, it expects, every teacher will have had training at Whidbey Island and will be able to return every four years for further training. Meanwhile a program for students will be developing so that by 1977 every student will have had the opportunity to spend a week on the Island and, by the end of his school career, two such opportunities.

During the latter half of 1970, a center task force was working out a proposal for expansion of the regional project and recommendations for a statewide program of environmental education as well. The regional plan, phased over four years, calls for development not only on Whidbey Island but at various other "satellite" sites offering environmental education opportunities--a 25-acre wildflower area, for example.

At the same time, mindful of the fact that man's environment includes much that he has altered as well as much that he has not yet managed to touch, the task force provided also for study of inner-city problems in Seattle and of such things as the consequences of industrialization in certain areas. The plan, complete with recommendations for state and other funding, was submitted late in the year to the U.S. Office of Education in the hope that it would qualify for a grant under the Environmental Education Act.

Huxley College is an important new element in the northwest Washington program. Huxley went into operation in the fall of 1970 at Western Washington State College, one of the cooperators in the Environmental Education Center and the site of the center's headquarters. Huxley is to be devoted altogether to the study of environmental problems, and teacher training is to be a major segment of its program. The college and its program are discussed at more length in the section dealing with higher education (p. 37).

Clover/Bees/Mice/Cats and Grass/Rabbits/Hawks

"The visits of bees are necessary for the fertilization of some kinds of clover.... Humble-bees alone visit red clover, as other bees cannot reach the nectar. Hence we may infer as highly probable that, if the whole genus of humble-bees became extinct or very rare in England, the red clover would become very rare, or wholly disappear and the number of humble-bees in any district depends in a great measure upon the number of field-mice, which destroy their combs and nests...."

Thus, in 1859, Charles Darwin in The Origin of Species acquainted the world with its ecological system. Some 110 years later, the National Assessment of Educational Progress asked 100,000 Americans aged 9, 13, 17, and 26 to 35: "In a particular meadow there are many rabbits that eat the grass. There are also many hawks that eat the rabbits. Last year a disease broke out among the rabbits, and a great number of them died. Which of the following probably then occurred?"

"A. The grass died and the hawk population decreased.
"B. The grass died and the hawk population increased.
"C. The grass grew taller and the hawk population decreased.
"D. The grass grew taller and the hawk population increased.
"E. Neither the grass nor the hawks were affected by the death of the rabbits.
"X. I don't know."

Twenty percent of the 17-year-olds and 30% of the 26- to 35-year-olds chose E.

ENVIRONMENTAL EDUCATION IN SCHOOL DISTRICTS

As with statewide programs, there are more good local environmental education programs than can possibly be reported in this publication. As with statewide programs, therefore, a few local programs are selected for outstanding features they display, and this is not to say that there are not many other programs just as good.

Niskayuna: Case Study in Community Participation

As an example of a community--including its high school students--pitching in to work out a program of environmental education from kindergarten through high school, few could excel Niskayuna Central School District No. 1, which includes portions of Schenectady, Albany, and Saratoga counties. Given a one-year deadline, a 12-member group put together in a few months a program so comprehensive and well designed that it was cited as a model by the Institute for Development of Educational Acitivities, Inc. (IDEA), at an early-1970 seminar on "The Schools and the Environment."

The Niskayuna story began in early 1969 with an amendment to New York State's health education law. Whereas earlier law had required a five-year program, the legislature now called for broad, mandatory health curriculums in all elementary and secondary schools in the state.

The State Commissioner of Education issued regulations which stated that, by the fall of 1970, "the elementary school curriculum shall include health education for all pupils...carried on by the regular classroom teachers. In addition to continued health guidance in the junior high school grades, provision shall also be made for a separate one-half year course.... In the senior high school, provision shall also be made for an approved one-half unit course...."

A new Bureau of Health Education in the State Dept. of Education developed a set of guidelines for school districts, breaking health education down into five "strands." These included, as Strand IV, Environmental and Community Health.

The Niskayuna School District responded to all this by establishing a Health Science Curriculum Committee and five subcommittees, one for each strand. The full committee numbered 28 members drawn from the school system, the subcommittee chairmen, the medical profession, the clergy, six parents, and two high school students nominated by their principal.

The Strand IV Subcommittee, consisting of one student representative, a middle school teacher, a high school teacher, two nurse-teachers, and seven community representatives, one of whom was chairman, went to work on Oct. 27, 1969. It, along with other strand subcommittees, was to submit its report and recommendations to a Health Science Advisory Committee, to consist of all committee and subcommittee members plus any other school district resident who volunteered. The Advisory Committee was to pass its own recommendations on to the full Curriculum Committee for approval or disapproval.

The great lengths to which the Curriculum Committee went to publicize the Advisory Committee and to appeal for volunteers demonstrate its determination that environmental education as well as other facets of health education receive the widest possible understanding and citizen involvement. In September 1969 a letter was sent to every person who had in any way indicated an interest in the topics which might be a part of the health curriculum. Three issues of Your Schools, the monthly report of the Board of Education sent to every district resident, contained lead articles urging everyone to send in his name and area of interest or expertise. Letters were sent home with students, notices were placed in school papers and bulletins, and announcements were made on public service radio programs. There were television interviews and a half-hour TV appearance by committee members. Those who attended Home and School Association and PTA meetings heard a description of activities and were urged to register as members of the Advisory Committee.

In mid-January 1970, as the reports of the subcommittees began to take shape, the Curriculum Committee made a final drive to enlist the cooperation of the community. As a result of all these efforts, a total of 409 district residents registered for the Advisory Committee, 100 of them students in the high school. With Curriculum Committee and Subcommittee members, the Advisory Committee thus numbered about 500.

The Strand IV Subcommittee, meanwhile, was hard at work. On Feb. 9, 1970, it submitted its preliminary report to the Advisory Committee.

This report contained an overview and a complete program of study. (See page 49.) The overview, somewhat abridged, follows:

> Curriculum Objective. We recommend the following as a statement of the purpose of the Strand IV curriculum:
>
> The primary purpose of instruction in public and environmental health is to provide the student with the knowledge he will need in order to participate in community decisions and actions to maintain the quality of the common environment and of the community.
>
> The secondary purposes aim to broaden the student's knowledge of the health problems confronting Americans and other peoples and to enable him to take proper advantage of the health services, facilities, and products available in his society.
>
> Curriculum Content. In order to accomplish the above curriculum objective, we recommend that the curriculum cover five general areas of subject matter:

- Epidemiology and Public Health.
- Environmental Abuse and Control.
- Health of the U.S. Public.
- Health in Other Countries.
- The Health Care Sector of the Economy.

Curriculum Emphasis and Orientation--We are recommending significant departures from the State's Strand IV program at several points, specifically in matters of curriculum emphasis, repetition of material, and location of topics in the overall teaching program.

Regarding emphasis, we suggest that a somewhat greater proportion of teaching time be devoted to "environmental abuse and control" and decidedly less to "consumer health" (i.e., the avoidance of quacks, frauds, misleading advertising, etc.).

Concerning repetition, we suggest that much teaching time and student patience could be conserved by rejecting the Education Dept.'s proposals to repeat all major topics two or three times during the school years. Accordingly, we attempted to arrange the material in such a way that most topics receive a single definitive treatment. This decision, unfortunately, largely eliminated ecology as an organizing concept since the individual topics generally fell more conveniently into other environmental health areas.

Regarding location in the overall teaching program, we recommend that the environmental and community health material at the middle school and high school levels be taught predominantly as part of the social studies and science curricula rather than as part of a separate health education program. There are two main reasons for this. First and foremost, the primary purpose of the Strand IV curriculum is to prepare the student to participate as a responsible citizen in community actions. Second, social studies and science is an area for which we already have an experienced and capable teaching staff in place. At the elementary level, the material could probably be taught as part of the general science or social studies programs.

Suggested Implementation--The major problems in implementing the Niskayuna environmental and community health curriculum are in obtaining educational materials and teacher training.

In considering available resources, excellent materials (visual aids, texts, pamphlets, periodicals) are readily available but widely scattered and usually treat single aspects of the subject. Texts dealing with the entire subject of environmental concerns are too general and not factual enough for a school program. Currently, federal legislation is proposed which will help solve the educational materials problem.

In the area of teacher training, our community possesses one very great advantage. We have excellent professional people, expert in the fields of air, land, water, and noise pollution, pollution control technology, epidemiology and public health, and medical economics. Some

of these professionals might be used on a volunteer basis for inservice teacher training.

It is recommended that a committee of faculty members meet to coordinate the program and make definite the areas to be treated on each grade level as well as to consider materials and resources. It will be necessary to make some funds available for curriculum development.

By considering the above recommendations, the study of environmental and community health can be introduced by September 1970 and can provide all students with a program of outstanding quality.

The Subcommittee recommended in its final report, May 6, 1970, that in curriculum writing "increased emphasis be given to the concept of man as an integral part of a finite ecosystem and to the importance of the challenges and responsibilities that this concept imposes," but that the general content of the earlier report stand. The Advisory Committee forwarded the earlier report, with the Subcommittee's May 6 recommendations, without change, and the program did indeed go into effect in September 1970.

Teacher training ran from mid-October to mid-November. Fifteen teachers met first on a Wednesday evening to get ready to ask the proper questions on all-day Saturday visits to the local water and sewage plants, to a factory, to a shopping mall to see what happens to the solid waste it generates, and to other installations. The teachers kept journals and took photos and planned to put these together in a publication to be used in future teacher-training sessions.

Wisconsin Cooperative Educational Service Agency 12

In four forced draft days, the Governor's Conference on Environmental Education recommended in February 1970 a 19-point plan for environmental education in Wisconsin.

Among the recommendations was this:

"The environmental education concepts developed by Robert Roth and described in Paul Gundlach's project report should be distributed immediately to all school districts so that curriculum development at the local level can begin immediately."

Who is Robert Roth, and what are his concepts? And who is Paul Gundlach, and what is his project? Roth, first of all, is a professor of conservation at Ohio State U. Through a review of environmental literature and interviews with 80 U. of Wisconsin scholars, representing 40 disciplines, Roth identified a set of 112 environmental education concepts. He had these rated for relevancy by a national panel of 350 scholars and fed the ratings into a computer. They came out ranked from the most to the least important. Gundlach is director of an ESEA Title III project in conservation education in Wisconsin's Cooperative Educational Service Agency 12. (The state is covered by 19 of these agencies, which provide audiovisual, data processing, and other services that can be handled more cheaply on a cooperative basis. Headquarters

of Service Agency No. 12, serving 11 counties, is located in the city of Portage, in south central Wisconsin.) Gundlach took the 112 concepts up with teachers from Agency 12's schools and learned that the 44 most important were introduced by grade 6 and were taught through grade 12. Accordingly these 44 were made the basis for a curriculum guide.

In the summer of 1969 the guide was tested with students from four schools for six weeks, after which 2 one-week sessions were held for some 80 teachers each. These teachers worked with the guide through the 1969-70 school year and then suggested activities that could be used to teach each concept. These were worked into the guide. Each activity was classified under one of six levels of learning--from simple knowledge through comprehension, application, analysis, synthesis, and evaluation. Pupils in kindergarten through grade 3 were considered normally capable of the first three, plus a smattering of analysis and synthesis, whereas evaluation was considered beyond most students until grades 10 to 12. The most important of Roth's concepts is: "The location of resources affects the economy of a region."

Here are two illustrative teaching activities suggested for use with this concept:

Grades 4-6 (knowledge level)--"Using a world map and population statistics, have students locate major cities. Students should then be asked what natural resources were in part responsible for the establishment of each city. Most of the cities will be located on or near water resources."

Grades 10-12 (synthesis level)--"Study the effect upon an area when a valuable resource has been discovered. Example: What happened when gold was discovered in California? This study could include the effect not only upon California but also on the entire country as people moved westward in search of gold."

This is what was in Gundlach's report, and this was what the Governor's Conference members recommended be distributed immediately to all school districts. Lack of funds prevented full statewide distribution in 1970, but Gundlach hopes for help on this via the Environmental Education Act. The Wisconsin legislature passed a state environmental act in December but appropriated no funds to put it into effect.

El Paso, Texas: 'No Water, No Water'

In a community in the heart of the arid Southwest, few things are always more on people's mind than water. Capitalizing on this, the El Paso Independent School District launched its environmental education program in the fall of 1970 with an imaginative fifth-grade unit centering on the importance of water to the city and its immediate area.

While the unit was developed, technically, as part of the fifth-grade science program, the planners--who were also working out a fourth-grade unit on "quiet pollution" and one for the sixth grade on air pollution for introduction later--quickly realized that the subject of water could be worked into other subject matter areas as well.

"The interdisciplinary nature of the water problem," it is pointed out in a teacher's guide, "should be obvious. The problem is historical in its development and affects society today (social studies). Problems related to water supply and conservation may be solved through scientific processes (science). These problems involve the handling of charts and graphs as well as many other statistical data (mathematics)."

Thus, in covering the history of El Paso, it is suggested that the teacher pose such questions as "Why did the Spaniards stay in the El Paso area?" (Water from the Rio Grande was one factor) and "What was happening in the community between 1850 and 1900?" (Development of a water distribution system, first through acequias, or aqueducts, later through pipes, was one thing, along with construction of a mule-drawn streetcar line, establishment of banks, etc.).

Culminating this part of the program, teams of six pupils each draw from an "in-basket" a problem such as this: "You and your brothers and sisters live with your family on the banks of the Rio Grande, which has been the family source of pure water for generations. An up-river family has just begun to grow irrigated cotton, and the increased use of water has reduced the flow of the Rio Grande to a slight trickle. In the deepest holes in the riverbed, where the trickle accumulates into ponds, the water is stagnating and is no longer fit for use. Your family must have a source of pure water. Solve the problem. Use diagrams, models, or written details to present your solution." The involvement of mathematics, graphic arts, English, and other subject matter--possibly even handicraft--in developing the solution is obvious.

An array of teaching materials, both printed and audiovisual, is provided throughout the program. One particularly intriguing example is a cassette tape recording called Days of Disaster. The teacher's guide says the purpose of this tape is to "stimulate or shock the pupils into the realization of the gravity of the water problem." Instructions to the teacher for presentation of the tape typify the careful--in this case, almost fiendish--attention paid to extracting every possible bit of drama from the course material.

Before the class enters, the teacher is told, "the water should be turned off below the laboratory sink. The radio should be in plain view and the tape recorder relatively hidden. As the class enters, the teacher should appear to turn on the radio while actually turning on the tape recorder."

Here, somewhat condensed, is the script of what the poor little fifth graders think is coming out of the radio:

> Announcer 1: Welcome, everyone. This week we are honoring our great state, Texas, and here's that state's most popular tune, "Galveston," by Glen Campbell. (One chorus)
>
> Another favorite of this fabulous state....
>
> Announcer 2: We interrupt this program to bring you a special bulletin. We take you now to Harry Pierson. Come in, Harry Pierson.

Harry Pierson: At exactly twenty minutes before nine at our nation's atomic testing grounds, Dry Flats, Nevada, a series of underground explosions was accidentally set off. Communications have been broken. Stay tuned for further news bulletins. (At this point the teacher is instructed to "become very interested and worried...question the children and try the faucet.")

Announcer 1: And now "This Land Is Your Land," by the New Christy Minstrels. (One-half chorus)

Announcer 2: We interrupt our program to bring you this special bulletin. (Helicopter sounds)

Harry Pierson: This is Harry Pierson speaking. I am in a helicopter over the test sight at Dry Flats. There appears to be quite a bit of excitement, but all damage seems to be underground. (Noise of panic--explosion--etc.)

The whole area's caught fire! It's spreading everywhere! Buildings are toppling like toy blocks! Oh, no! It's like the whole earth just opened up and swallowed everything! Our helicopter is too close! Pull up! Pull up! (Sound as though radio has gone dead, then static buzz)

Announcer 2: Due to circumstances beyond our control, we are unable to continue our broadcast from Dry Flats. In the meantime, Dr. Richard Grange, noted seismologist, reports that a series of earthquake waves has just been recorded on the seismograph. Tremors were felt here in El Paso lasting over 7 minutes and causing serious damage in the downtown area. I have just been handed a special message. The President will report to the nation in just one minute.

(Station break)

ABX now reports the following. Incredible as it may seem, it is entirely possible that as much as one-fourth to one-third of our nation has been completely destroyed.

Over one-half of the rest of the nation is threatened by an even more urgent problem. Since the earthquake, some cities have had a reported loss of their water supply. Here in El Paso, water barely drips from an opened faucet. All water seems to be draining away! (Pause) Ladies and gentlemen, the President of the United States.

President: (A call for calm...Face this day of disaster with a nation united, etc.)

Announcer 1: You have just heard the President of the United States. Most of the nation is completely blanked out. I'm not even sure all this is being heard. (Static) We are leaving the air to attempt repairs that.... (One-half minute pause with continuing static)

Harry Pierson: Hello! Hello! Emergency! This is Harry Pierson!

As I speak these words, I have the thought that I may be the last living man on earth. My friends...my family...my...my world...Where are they? How can I (dying gasp)...no water...no water....

The understatement of the century may well be an "Observation" appended to this section of the teacher's guide: "The pupils will realize the necessity for concern over the water problem."

Nashville, Tenn.: The Schoolyard Is Their Laboratory

The title of the Nashville, Tenn., environmental education manual for elementary school teachers is What Is the E.Q. (Environmental Quality) of Your School? The title, reflecting as it does Nashville's approach to environmental education, is remarkably appropriate. Of all the school districts replying to the Education U.S.A. survey, Nashville seems to be the most alert--judging by the manual--to the possibilities of using the schoolyard and its immediate neighborhood as a laboratory for environmental education. Moreover, sensing that this use of schoolyard and neighborhood would bring environmental problems close to home for its schoolchildren, making these problems their problems, Nashville channels environmental education in such a way as to suggest to the children that they do something about repairing environmental damage that they find.

To quote from the manual's introduction:

"It is hoped that each school will make a survey of the environmental quality of not only the immediate school site but the surrounding areas. Making a survey alone is not enough. If bad conditions are found, many can be changed by the children themselves, and others can be called to the attention of the proper agencies and the community. Discussions on conditions and ideas on solutions are important also. Children are never too young to learn more about the problems of their environment, and how they must get involved themselves in order to help these problems get solved. As important as reading, writing, or arithmetic is the awareness of themselves and their community."

Nashville makes environmental educational use of the schoolyard and its neighborhood in two general and inexpensive ways--to study pollution in the form of litter and to make ecological studies of the soil and plant and vegetable life. The teacher's manual also covers study of air and water pollution, using equipment no more complicated than would be found in any kitchen, but this is done mostly indoors. At every opportunity the manual points out ways to involve language arts, social studies, and mathematics in environmental problems.

Here are some highlights from the unit on litter:

Billions are spent each year just to pick up trash. This is one area where every child can help. If he can be taught to take care of the land and not litter, a great step will be taken to help solve this problem. It costs 35¢ in taxes to pick up a pop bottle, candy wrapper, or other similar item discarded along our highways and in our parks.

Take a walk with the class around the schoolgrounds or a nearby park, picking up bottles and papers, and putting them in trash cans. Keep a record of the items picked up. How much did the class save taxpayers?

You can make a math lesson out of the fact that one American is responsible for one ton of garbage per year. How many pounds is that per person each day? What happens to all that garbage?

A. Make a litter survey on the school site...it can be used as a projection of other areas; that is, if an area this size has this amount of litter, figure out what the entire block might have.... The litter should be collected; many things can be done with it. This should be discussed with the children:

1. Should it be burned? (No, puts pollution into the air.)
2. If we put it into the dumpster, where does it go? (Check this out.)
3. Could any part of it be used over again? (Paper, made back into pulp, metal remelted?)
4. What could we do with it? (Pop art might be made with some.... Scrap wood and other materials can be used in crafts; some of the paper can be made into paper mache.)

Let the children come up with some ideas, both for this litter and for the problem of litter.

B. What about the waste taken from the school and all garbage cans, etc., each day? (Some garbage could be turned into fertilizer for crops. One German city and one U.S. city are now using special machinery that uses all forms of trash and waste as power--even the smoke is used--but the machinery is expensive to install.) Let the children "brainstorm" on this; they might come up with some good answers. Bring out that, in the long run, it would be better to find a method to use the waste than to allow the waste to pile up.

C. Discuss the litter problem in relation to the school. Have the children look around them; check the waste basket. Need all the litter be? Don't we waste a lot because we have so much? ...Discuss containers, why our nation seems to have fancy boxes, etc. Does this really make the product better? Could we cut down the cost of the waste by using less container? Would this cut down the cost of the item? (They can check this out by comparing a new item in the store, i.e., the cost of a "new potato chip" in a special box with that of the same quantity in a bag.)

D. Organize a Litter Police. At a certain time each day allow the members to go out and collect the litter from the school yard. Make it important with a badge, sack, etc.--an honor.

E. Make posters about litter.

F. Write letters to some of the soft drink companies urging them to stop putting out no-deposit bottles and asking that cans be redeemed

also. It is never too early to help the children understand their voices can help in a campaign if done correctly.

If the children have come up with some original ideas on how to use bottle tops or cans, send these ideas to the companies also....

G. Concept: It is the responsibility of every adult and child to dispose of trash in a suitable way in order to prevent litterbugging and to keep America beautiful.

Problem: Is it possible to tell from the kinds of trash deposited on the sidewalks and streets on the way to and from school the ages of the litterbugs?

Procedure: The children fill paper bags with the refuse found on their way and the teacher lists on the chalk board the amounts and kinds of materials contributed by each child. The things that are tossed aside by adults as well as by children should indicate that litterbugging is not restricted to any particular age group. To make this a meaningful experience the children must understand that they have a job to do in <u>not littering themselves</u>.

Moving out into the neighborhood, in the unit on land use the manual suggests several areas, including science, in which a vacant lot may become a teaching resource. "A vacant lot is not empty at all," it begins, "but full of things which tell a story about the ever-changing earth and its resources. Valuable science learnings may be made if the owner of the lot will permit children to dig in the earth."

Features such as beaten paths, land formations, rocks, plants, and animals may be studied in many ways, the manual suggests, these being a few:

- Find a path that has been made by the trampling of people's feet. Why did people select this path? Note that often no plants grow where the soil is trampled down, but that there may be plants in low spots where the soil has not been compacted.

- Look for signs of erosion. Water may have washed topsoil from high spots to lower ones.... Stones may stand on little pedestals of soil which they have protected from the force of raindrops.

- Dig a hole to determine the depth of the topsoil. Use a hand lens to note that it is composed of mineral particles mixed with plant and animal remains. Compare the topsoil with the subsoil. Find leaves and stems that are disintegrating to become part of the soil.

- Turn over large stones to observe animals living under them.... Point out that some animals have adapted to living in the conditions which exist under such stones.

- Examine old logs or pieces of wood that are being decomposed by fungi or insects. These fungi and insects are freeing the minerals in the wood, returning them to the soil.

- Look for earthworm casts, little piles of earth left on the surface as the earthworm makes its tunnels. Earthworms take plant material down into the earth, where it breaks up to help form soil. The tunnels of earthworms admit air and moisture to the soil.

A striking feature of the Nashville program is that, once the general features of environmental education are laid down, it gets right down to specific environmental problems that may be part of the life of many children and suggests ways in which even children can do something about them. An entire unit in the teacher's manual is devoted to such special problems as rats, odors from factories and other sources, and the hazards of vacant houses, scattered junk, dumps, even of traffic on streets lacking sidewalks. "Once the children become aware of the meaning of pollution, of litter, and of health problems," the manual points out, "they are more likely to be able to find examples in their community. These should be discussed and possible solutions brought out. This is where the real learning takes place."

Here, condensed somewhat, are suggestions for studying, and acting on, the rat problem:

> In the inner city, and even in the suburbs, there is always the danger of rats. It is important to work on this problem through the home and community because it takes a combined effort to get rid of this pest.

Questions:

- Why are there so many rats in the city? (When the city was built such animals as fox, snake, owl, and hawk disappeared. This allowed the rat to multiply.)
- Why are rats so bad? (They are dirty; spread disease.)
- Besides spreading disease, why are rats so destructive? (Rats are rodents. The front teeth of rodents continue to grow. The rat must keep gnawing in order to keep their teeth ground down.)
- Why are we getting more rats in our house if we don't leave food out? (In some areas houses are being torn down. The rats that used these older houses for shelter are seeking another place to live and will go to the nearest house.)
- How do we get rid of rats? (By taking away their food and shelter, using poison to take the place of the predators.)

Activities:

How can children help?

1. Survey the community; see if there are spots where rats could find food and shelter. Organize a Rat Patrol. Material is available from the Health Dept. that can be given to people in the community.

2. Make sets of canisters (coffee and other cans with tops), covered with wall paper or contact paper, to be used in each student's home to hold food usually left in a bag.

3. Have each child survey his home for any holes, etc. Rat holes can be stopped up by nailing tin over them.

Ann Arbor, Mich.: An Early Starter

The Ann Arbor conservation education program goes back to the spring of 1960, when the school district got together with the local Audubon Society on a pilot project in which one school used the Society's newly developed nature center for guided field trips. Ann Arbor's interest in outdoor conservation education, however, goes back even further. A pioneer in school camping, it had for a long time encouraged teachers to extend their classroom into the out-of-doors and in 1933 had integrated field trips into its junior high school program.

The experiment with the Audubon Society was so successful that the Society opened its nature center to all the district's schools in the fall of 1960, and in January 1961 proposed to the board of education that it employ a program coordinator to direct and expand what was now a going outdoor program. The coordinator, the superintendent, and other school officials agreed on a set of principles calling for a K-12 program, with continuity and progression from year to year, integrated and correlated with the existing curriculum. It was emphasized that the program should stress attitudes since "the most important conservation impact that most of our urban children will have upon our natural resources will be through their action as community citizens." As development of the program went on, themes, understandings, and sub-understandings--along with teacher's guides and printed and audio-visual instructional materials--were formulated for each grade level.

The simple theme for kindergarten is: "The number and kinds of living things that we see around our school and neighborhood vary with the four seasons. These plants and animals affect each other and help to serve many of our needs." Kindergarten understandings are such as: "Each kind of plant and animal has certain requirements, and these determine where it can live," and "Plants and animals are very important to man because they help to serve many of our needs (food, clothing, transportation, shelter, pleasure)." From kindergarten on up through sixth grade, themes and understandings become more advanced, the sixth-grade theme being "The relationship between resources are complex, and the management of any one resource requires careful consideration of the probable effect upon others."

While in elementary school the program is blended with the science curriculum, in the secondary grades it is divided between science and social studies. Eighth-grade general science students, for example, study about "Population Increase and Its Impact upon Natural Resources." American government students in the 9th, 11th, and 12th grades consider "The Huron River Watershed Intergovernmental Committee (which studies and recommends solutions to water problems in the basin of the Huron River, on which Ann Arbor is located) and "Controlling Water Pollution: Intergovernmental Relations." At

all levels except kindergarten, environmental study pivots on a field trip to one of five outdoor sites, with orientation before the trip and follow-up after it. The coordinator visits each elementary class a few days before its trip and then goes with it on the trip.

Early in the program Ann Arbor recognized that for several hours a day a schoolchild's environment is confined to his schoolgrounds. With the school population burgeoning, and with new schools being built almost continuously, Ann Arbor asked why new grounds should be covered with blacktop. Why not, it asked, preserve as much as possible in its natural state for use as an outdoor laboratory? The procedure that Ann Arbor goes through to retain and enhance these natural features is so fascinating that a description of it is included in this report. (See page 43.)

Lanesborough, Mass.: Enrichment in the Out-of-Doors

Not as an end in itself, but as a means of enriching the entire educational experience of its students, the Lanesborough School in 1965 adopted a course of study centered almost entirely around "outdoor education" which, upon examination, proves to be environmental education in the real sense.

The result of initiative by teachers, the program is based on the philosophy stated in a teacher's guide in these words: "Outdoor education is not a separate discipline or a separate area of study. Outdoor education is a method of education.... Literally every subject in present-day curriculum can be enriched through outdoor education. More important, subject areas tend to lose their bounds or identity in the outdoor classroom and become related and integrated as ideas and facts take on fresh meaning and perspective. Outdoor education is not an adventure in education but an adventure in learning.... It reinforces abstract knowledge with concrete experience.... It is harmonious with child-centered and society-centered approaches to learning. It is an audiovisual aid of the first dimension."

As far as environmentalism itself is concerned, the key element in the Lanesborough program is found in the teacher guide's statement that "one of the most significant contributions that outdoor education can make to this generation is to reestablish the fast disappearing, yet vital, link between man and his earth. In the outdoor classroom, one can teach as well as learn about the interdependence of all living things and can gain a genuine concern for the wise economic use of our priceless natural resources."

Even this commitment to environmentalism, however, assumes a humanistic place in the Lanesborough scheme of things. While "outdoor education makes a child sensitive to his surroundings," the teacher's guide emphasizes that its real value comes in that "it focuses attention on the aesthetic and ethical needs of children and on the constructive use of leisure time."

Within this framework, Lanesborough articulates classroom work with short outdoor lessons, longer visits to sites at a distance from the school, and--as a major activity--trips of up to three days to Hawley State Forest, which is well equipped with year-round living quarters. All told, Lanesborough pupils get some 200 outdoor lessons a year. The Hawley program, and the

activities that go before and after actual visits to the park, well illustrate the thrust of the entire Lanesborough approach. The program is organized around three separate trips: a two-day and one-night trip for fifth graders in early spring, a similar one for sixth graders the following fall, and a three-day and two-night trip for sixth graders the following spring.

Subject matter areas covered are these:

- Science, study of pond and brook life.
- Ecology, environmental study of animals and their habits.
- Geology.
- Conservation, emphasizing fire prevention and forestry.
- English, the effects of nature on American literature.
- History, an archeological approach to historical research (using, among other things, several old houses found in the park).
- Mathematics, a unit on measurement (of the height of trees, for example).
- Reading, poetry and readings related to nature.
- Astronomy.
- Physical Education.
- Arts and crafts, music, and drama (incorporated into evening programs).

Typical of the way an academic subject is integrated with the out-of-doors is the English program drawn up by Mrs. Margaret Gallant for the first spring trip. First, quoting Albert Schweitzer that "all life capable of development is an ideal to cherish for ourselves and our children," Mrs. Gallant continues: "The quote depicts the attitude which should be instilled in each child prior to a conservation trip. Books and stories can reinforce this attitude. Stories of animals suffering from cruelty or misunderstanding can give a child an admiration for the spirit that can't be downed. In other stories animal habits are cleverly woven into the plot."

Mrs. Gallant recommends that pre-trip reading classes center on such books as The Tadpole and the Great Bullfrog, by M. Flack, and Amik, the Life Story of a Beaver, by Lois Henderson. She recommends too that the children collect a library of stories and poems about animals. During the stay at the park, Mrs. Gallant suggests the children do campfire skits about some facet of conservation or animal life, drawing both on their observations in the woods and on the books they have read.

Wellesley, Mass.: 'The Muck in the Mock'

An interesting case-study approach to environmental and ecological education has been developed at Wellesley and has been worked into the existing K-6 curriculum with the intention that it eventually encompass the entire K-12 and adult education curriculums. Developed through a grant made under Title III of the Elementary and Secondary Education Act, the simply and clearly written case studies include a description of a hypothetical situation or problem involving mythical cities or nations, with enough background to set the stage and enough data for a student to identify with the situation. The case documents are often accompanied by maps and are calculated to provoke elaborative thinking, critical analysis, and discussion over several class sessions.

The case study concepts range from such relatively simple ones as "The Town of Middleboro" (where should an incinerator be built?), through somewhat more complicated ones like "The Muck in the Mock" (a city's water polluted by its up-river neighbor), to some involving really complex national or even international issues like "Iron Ore--An Investment" (efforts of an economically deprived country with large iron deposits and a prosperous industrial country to get together, and possible consequences if they do). As a fairly typical example, here is the full text of "The Muck in the Mock," which was accompanied by a simple map:

> The Mock River is about the size of the Charles River and flows through Aylesville and Burleigh to the ocean. Burleigh is located where the river meets the ocean. Its taxpayers have for many years supported and paid for filtering equipment and disposal plants that would keep their town and waterways free of pollution. Their anti-pollution laws have been enforced.
>
> Aylesville, further up the Mock, has developed rather quickly from a small farming community into a fairly active industrial town. Industries had settled in Aylesville because of the fine supply of water from the Mock and from nearby springs. Aylesville has neither antipollution laws nor facilities because it grew too fast and proper planning wasn't done. Aylesville doesn't suffer too noticeably from pollution. Its industries and sewers, however, deposit waste directly into the Mock, with the natural flow of the stream carrying this polluted water toward Burleigh and the ocean. The citizens of Burleigh are most affected. They are very upset.
>
> Because of increasing pollution, particularly southeast of Aylesville, the Mock is now being called the "Muck." While ocean tides clean the Mock up to the rapids, the tidal flats that once supported many shellfishermen are now barren. There are no longer fish in the Mock between the rapids and Aylesville. The Mock has become sluggish and smells very bad. The property on Burleigh's riverfront, once considered the best area in town to live, has lost much of its value. The marina will probably close this fall because few boatmen care to enter this foul water.
>
> The protests from the town of Burleigh are politely listened to, but no action is taken. Say the officials, "It's too expensive to do anything about," or "The industries will close up or leave if we try to make them correct the problem. That would be the end of our town."
>
> Finally, officials of both communities agree on the forming of the Mock River Commission, an official group made up of an equal number of people from Aylesville and Burleigh. The Mock River Commission has no power, funds, or authority. It has been given the responsibility of "making recommendations to the governments of the two towns that will reduce and end this blight upon our glorious Mock, subject to the vote of approval of the citizens of Aylesville and Burleigh." You have been appointed by your mayor to the Mock River Commission and will represent the best interests of your community in trying to find a solution.

HIGHER EDUCATION

All authorities agree that for environmental education to be really effective it must be interdisciplinary. This may be fairly easy to accomplish in the elementary classroom where one teacher can bring environmentalism to bear on every subject, and still fairly easy in secondary school, even though a student may have a different teacher for each subject. In higher education it is not easy at all. Indeed, with a few exceptions, it has been found virtually impossible.

Edward J. Ambry, director of the New Jersey State Council for Environmental Education, nutshelled the reason in his testimony at the Brademas Subcommittee hearings on the Environmental Education Act: "As things stand now, it is difficult for higher education personnel to identify with environmental education. It is outside the mainstream of the higher education hierarchy. It is outside of the accepted 'reward system' for promotion and salary adjustment."

Ambry's words told a story-repeated--and enlarged upon--time and again before the Subcommittee and elsewhere. As an outstanding example, a release in September 1969 by the President's Environmental Quality Council quoted from an "open letter" by J. Kenneth Hare, professor of geography at the U. of Toronto: "...We all know the conservative quality of such places (universities) where nothing can easily be done for either the first or the last time. The status quo is defended in depth by the vested interests of a large number of able people--humanists, social scientists, natural scientists, and professionals like lawyers and engineers.... Environmental studies have to involve many of these clans, which are not used to combining in the way required. If we suggest, as I do, that some of them--notably the humanists--may be utterly transformed by such combinations, we alarm the timid and anger the Tories among them."

The 1969 report finds that the consequence of the situation stated by Hare is that when universities are faced with a demand for a problem-focused activity like environmental education, their response usually is to set up a "center" or an "institute." In most cases, it says, "these institutes have been largely paper structures, and their impact on the universities and, especially, on the students and the public discussion surrounding the work has been negligible. Curriculum, faculty rewards, and most of the research has been controlled within the departments representing the narrow academic disciplines."

The report noted with emphasis that the development of such institutes "contrasts strongly with the history of agriculture and public health, in

which curriculum, faculty, and research were centered in schools that were nearly autonomous," and one of its strongest recommendations was this: "We recommend that the federal government support formation of schools of human environment at colleges and universities.... Their common purpose...should be problem-focused education and research directed toward people.... Such schools or programs can begin the task of providing trained professionals to work on environmental problems, help define what is possible and how to get it, and provide opportunities for the justifiable desire of many young people to devote their attention to environmental problems. In particular we recommend that such programs meet the following criteria:

1. "Substantial or complete control of the faculty reward structure.

2. "A relatively free hand to be innovative in introducing course material, educational programs, work-study programs, and curriculum requirements for degrees.

3. "The focus of environmental programs should be expected to vary from institution to institution, and the funding agencies should ascertain only that there is a problem focus to the activity."

Some "schools of human environment" such as the Council proposes already exist. Rutgers, the state university of New Jersey, in 1969 reorganized its College of Agriculture as a College of Agriculture and Environmental Science. The College's program includes inservice workshops for elementary and secondary teachers, specialized undergraduate and graduate study, and environmental research. As another example, East Central State College, at Ada, Okla., opened a School of Environmental Sciences in September 1970.

On the West Coast, the trustees of Western Washington State College, at Bellingham, in 1968 authorized this institution to set up Huxley College, which will focus on the environment. The Huxley plan is based on general areas of environmental studies called concentrations. Each area is broad enough to allow either social or natural science programs and may involve studies in a number of disciplines. Included in the concentrations are ecological systems analysis, environmental control, environmental planning; hunger, food, and malnutrition; marine bioresources; and population dynamics. A student seeking a degree in environmental sciences will spend his first two college years as a regular Western Washington student, working as indicated with Huxley faculty members, then enter Huxley as a junior. In addition to working in their concentration, all Huxley students will take certain core courses surveying major ecological principles, interactions in the environment, the effects of man on natural systems, etc. Prospective secondary school teachers may earn a degree in environmental science while taking enough education courses to teach in that area. Prospective elementary school teachers may combine a concentration or concentrations with the elementary major.

While interdisciplinary rivalry was not an overwhelming obstacle to setting up colleges of environmental sciences at institutions like Rutgers, East Central in Oklahoma, and Western Washington, these enterprises nevertheless did have to be fit into existing institutions. Seldom does an educator get the opportunity that came to Edward W. Weidner in 1966 to plan from scratch a university campus and program centered entirely on environmental

education. The result of three years' effort by Weidner--and, to be sure, a host of citizen advisors, the president and regents of the state university, and others--was the opening in fall 1969 of the U. of Wisconsin-Green Bay (UWGB), with Weidner as chancellor. The new university is unimpressed with "the way it has always been done." As one evidence of this, it abandoned long-standing disciplinary slices in setting up its four "theme colleges," all of which focus on ecology. The university catalogue describes them:

1. The College of Environmental Sciences: The foci here are problems and challenges in environmental control (i.e., man's attempt to change his resources or biophysical environment) and analysis of ecosystems (i.e., man-environment interchange).

2. The College of Community Sciences: This College emphasizes the processes by which man relates to his social environment (community) and undertakes to make it accommodate to his purposes.

3. The College of Human Biology: The central focus here is human adaptability. Human adjustment to the impingement of physical and social environments--our physical, mental, and social health and well-being--is stressed.

4. The College of Creative Communication (CCC): Human identity is the central concern of CCC. In a way it is a companion college to Human Biology. The latter focuses on the environment's impact on the individual; CCC focuses on the individual's impact on the environment.

Each theme college has the responsibility for teaching, research, and public service programs relative to its special environmental concern. Each offers work in appropriate liberal arts and sciences disciplines as well as courses specifically tailored to its environmental focus. All disciplinary courses specially emphasize the subject's relevance to environmental problems. Interdisciplinary courses are frequent.

The School of Professional Studies (SPS) complements the theme colleges and is not analogous to them. It is responsible for professional programs that relate to all or nearly all the theme colleges. Undergraduate majors in business and public administration are available through SPS. However, a theme college must be selected in which special work is undertaken in regard to man's environmental problems. Business and public administration are fields that can contribute much to the alleviation of such problems.

What is Green Bay's philosophy and how does it go about putting that philosophy into action? Weidner told about this in an address in March 1970 to the American Assn. for Higher Education:

> Superficially, it may appear as if the U. of Wisconsin-Green Bay is like any other institution. We train chemists, biologists, physicists, and mathematicians. We train business administration specialists, elementary and secondary school teachers, artists, musicians, and actors. A student may select a foreign language, English, philosophy, or history. And all of the social sciences can be found as well. There is much that is familiar at UWGB.

The U. of Wisconsin-Green Bay is one of the few institutions in the United States that has a focus for all of its activities. Our focus is man and his environment. It is our aim to make every part of our program related to our ecological crises. Whether it is teaching, research, or community outreach, the focus of the University remains consistently that of helping student, professor, and community member to relate more effectively to the environment and to <u>do</u> something about the environment.

We term our institution a communiversity. A communiversity is a socially responsible university relating to a socially responsible community. It conceives of the universe of a university as being the living, breathing, larger community of which it is a part. Thus UWGB is based on two fundamental ideas--namely, a focus on man and his environment and acceptance of the concept of a communiversity. As a consequence, UWGB has forged an educational program that departs from traditional paths. First of all, there is a true reciprocal relationship between UWGB and its surrounding community.... Secondly, teaching, research, and community outreach meld into a single intellectual function. If one is studying pollution of a river or the decay of a downtown urban area, the functions of teaching, research, and community outreach are one....

Thirdly, a focus on ecology and communiversity requires extensive and frequent contacts between faculty and students outside the classroom as well as inside....

Fourthly, UWGB's approach requires considerable student initiative in learning, as well as initiative by faculty members. If students are to play a major role in our environmental struggle in the decades ahead, they must learn to sort out their values clearly, identify the major problems, get adequate information to relate to the problems, and carry out a program of cooperative action....

Fifthly, the UWGB philosophy requires that a university must be organized to devote itself to ecological problems, rather than be imbued with the sanctity of individual disciplines and professions.... In faculty hiring and faculty organization, there is little concern with the field of a professor's Ph.D. There is much concern with the kinds of ecological problems on which he wishes to focus....

At UWGB, a student selects an environmental problem that forms the center of his intellectual interests. If none of the formally stated ecological problems satisfy a student, he is invited to formulate his own environmental problem on which he wishes to concentrate. The environmental problem then becomes the central point of relevance for a student's program. He chooses courses in the various disciplines and the various professions that contribute to thinking, problem solving, and decision making in regard to the particular environmental problem. Thus chemistry, art, secondary school teaching, and psychology all of a sudden come alive. They are means to a social end.... The world outside the university is just as relevant to a student's learning objectives as the world of books....

NATIONWIDE PROGRAMS OF ENVIRONMENTAL EDUCATION

Numerous nationwide organizations are active in the field of environmental education, some of them working with agencies of the federal government. Even before passage of the Environmental Education Act of 1970, several federal agencies had themselves been active in the field, and passage of the Act, directing that an office of environmental education be set up in the U.S. Office of Education, gave promise of an even greater federal effort.

The long standing and well known contributions of such organizations as the Audubon Society, the Sierra Club, and the Conservation Foundation have begun, in the past two or three years, to be supplemented--it seems almost daily--by an array of new programs. Among these, one of the more interesting is that undertaken cooperatively by the U.S. Dept. of the Interior and the National Education Assn. (NEA). The Interior-NEA program originated with the National Environmental Education Development (NEED) program of the Interior Dept.'s National Park Service, which by late 1970 had produced teacher guides and student materials for grades 3-8, with the intent of eventually covering kindergarten through high school. Coupled with NEED is a nationwide network of National Environmental Study Areas, which are available for use by local school districts, using NEED study materials together with regular school curriculums to relate children to their environment and to instill in them a sense of responsibility for it.

In September 1970 the NEA's Assn. of Classroom Teachers (ACT) and the American Assn. for Health, Physical Education, and Recreation (AAHPER), an affiliate of the NEA, joined with the Interior Dept. in an effort to put NEED into the classroom. ACT, in cooperation with AAHPER, published a comprehensive guide setting forth the NEED program step by step and telling teachers how to bring it to their own pupils.

The guide is called Man and His Environment: An Introduction to Using Environmental Study Areas (National Education Assn., 1201 16th St., N.W., Washington, D.C. 20036; 55 pp., $1.75). Not confined to nature study, the guide shows the teacher how to use the environment as a setting to teach art, mathematics, science, social studies, and communications.

It is not necessary that the study area be a national park or other vast or distant location. "We emphasize in our booklet," ACT Pres. Donald F. Wilson said in announcing the publication, "that this program is practical and feasible for every school district in America.... An environmental study area can be established in a local park, at a state monument, or even in a city neighborhood."

Another 1970 development was the Public Broadcasting Environment Center, set up by the Corp. for Public Broadcasting with the help of a $600,000 grant from the U.S. Office of Education. As part of an overall plan that included a year-long weekly prime-time television program called Spaceship Earth, the Center announced an elementary-secondary education project, "Life Ways."

Plans for "Life Ways" included:

1. Three- or four-minute TV programs titled "Ways It Is," designed to heighten environmental literacy by exploring ecological cycles and relationships. While usable by local public television stations, "Ways It Is" would also be adaptable for classroom use.

2. Ten-minute segments of Spaceship Earth called "Ways To Go," exploring the interrelationship of man and his surroundings. These segments could be converted to slides or prints for classroom use.

3. Weekly 25-minute radio programs under the title of "Byways," acting out, in "you-are-there" style, some stories of environmental concern.

4. "Pathways," printed and audiovisual materials to support the broadcasts. The Center planned to provide kits at first for children aged 6 and 7 (perhaps including "objects to touch"), kits for children aged 10 and 11, packages of combined subjects for high school students, and packages of combined subjects for teacher training.

Foundations, too, are busy in environmental education. As just one example, the Ford Foundation in 1970 made two grants in the United States and one in Canada to promote elementary school teachers making use of a school's own environment as a source of learning experience.

The U. of Colorado received $176,000 to support a team of advisers to train teachers in Boulder, Golden, and Denver. The U. of Western Ontario's Althouse College of Education received $273,000 to train teachers, initially 30 of them at three Ontario schools, eventually 120 at nine.

A grant of $140,000 went to the International Center for Educational Development, which provides advisory service to public school teachers in Los Angeles. The Center's project was to focus on four elementary schools--in the Watts ghetto area of Los Angeles, in the changing suburban area of Inglewood, in a suburban-rural area, and in a small rural community.

Many national organizations with an environmental mission are heavily involved in adult education, much of it aimed at stimulating citizen action. The Citizens Advisory Committee on Environmental Quality, appointed by President Nixon, published a report, Community Action for Environmental Quality, which lists 22 private organizations standing ready to help citizen groups. The report, which also gives addresses of regional offices of federal agencies with environmental programs, is full of useful tips for citizen groups. ("Homework is the reason the League of Women Voters has been so effective with water resource projects; they usually end up knowing more about the local problem than anyone else.") The handbook is available for 60¢ from the Supt. of Documents, Washington, D.C. 20402.

The Environmental Education Act, as has been mentioned, provides for grants for adult education and community conferences on environmental quality and ecology, especially for state and local government employees and community, business, and adult leaders. Representative Brademas, discussing the then-pending legislation at the IDEA seminar, commented: "Indeed, adult education is imperative if we are to reach the government leaders, corporation executives, and local officials whose policies have contributed to some of our major pollution problems."

One adult activity of the sort that might be supported under the Act is Minnesota's Environmental Science Center, already cited in the section of this report dealing with state programs of elementary-secondary environmental education. In addition to developing school curriculums, the Center has issued A Handbook for Environmental Action and assists local citizen groups in a variety of ways.

Another is the ABATES project (Ambassadors To Bring Action Through Environmental Study) sponsored by the New York State Dept. of Health's Division of Pure Waters. ABATES, launched in October 1969, works through such statewide groups as the Grange and the Business and Professional Women's Club to organize local study groups. The Division furnished study materials and suggestions for ways to combat water pollution. By mid-1970 there were 193 study groups, 149 adult and 44 youth, with a total membership of 4,216.

The Unmentionable Becomes Mentionable

Something that was usually spoken of only in guarded tones, especially in elementary and secondary education, is now spoken of openly in connection with environmental education. This is what Prof. Clay Schoenfeld of the U. of Wisconsin-Madison calls "the hitherto unmentionable demands of the Neo-Malthusians for population control."

"I would recommend," said Matthew J. Brennan, director, Pinchot Institute for Conservation Studies, "that development of understanding of the problem of balancing the population with the available resources of the earth should be given priority in any environmental education program.... We are kidding ourselves if we continue to concentrate on the visible effects of overpopulation--pollution, pesticides, poverty of the environment, the 'P' problems, I call them.... If we allow the U.S. population to double by the year 2000, as experts predict it will, we can spend every dollar in the federal budget every year and still do no better than keep even with the 'P' problems."

Brennan's view has been seconded by several others. "Without population regulation, disaster is inevitable," said LaMont Cole, Cornell U. professor of ecology. Garrett de Bell, Washington, D.C., representative of Zero Population Growth, an organization which he said "is actively working for stabilization of the population of the United States," urged that the Act "be modified to specifically include population and the balance between population size and environmental quality."

AN OUTDOOR LABORATORY FOR YOUR SCHOOL?

The following article, written by William B. Stapp, conservation consultant for the Ann Arbor, Mich., Public Schools, appeared in the December 1965 issue of Ward's Bulletin.

In most school systems little or no consideration is given to ways the school site can be used to enhance the school curriculum prior to the construction of the school building. For this reason many of the unique educational features on school sites are lost during the construction stage. The site becomes leveled, the native vegetation is stripped from the land, and the natural water areas are destroyed. Under these conditions the learning opportunities are far more limited, the environment is less pleasing, and the microclimate more severe.

If one believes, like I do, that certain social and scientific understandings can be best taught beyond the four walls of a school building, then educational specification plans should be developed both for the site and the building.

I would like to describe a procedure operating in our school system that is effective in establishing outdoor laboratories on school sites. In the selection of school sites, consideration is given to locations possessing natural features that can be utilized to enrich the school's educational program. Once the land for the school site has been acquired, a school site committee is established to develop educational specification plans for the total site that will take advantage of unique natural features on the site. The site planning committee can be of great assistance to the school architect in making recommendations, such as taking advantage of uneven topography in the layout of the site plan, the preservation of unusual specimen trees, or an area possessing a variety of habitats for an outdoor laboratory.

The planning committee should be composed of a school board member, the school architect, the school principal, teachers representing various areas of the curriculum, and students. Joint planning between administrators, teachers, and students will enhance the use of the school site, discourage vandalism, and perpetuate its use and value to the community.

During the period that heavy equipment is on the site, provisions must be made to make certain that the recommendations submitted by the site planning committee and approved by the school architect are fulfilled. It is important that the operators of heavy equipment be well oriented to the site plan and to the features on the site that are to be preserved. It is usually advisable to place markers around trees or habitats that are to be undisturbed.

As the school is being constructed, the landscaping phase of the site can be developed. This plan should be well conceived to blend beauty and utility. Plantings that provide food and cover will attract small animals for observation purposes that might otherwise not be seen

around the school building. Thought should also be given to the placement of plantings to improve the microclimate. Proper plantings can make classroom and recreational areas more comfortable throughout the year.

Technical assistance is normally available to every school system through the services of the district soil conservationist, game manager, and forester. The district soil conservationist is available to assist schools by making a soil map of the site. A soil map is very useful in selecting trees and shrubs to plant on the school ground. The soil conservationist might also be helpful in determining the suitability of the creation of a small pond on the site. The district game manager can offer technical assistance as to types of plantings and their placement for wildlife. The district forester could provide schools with information regarding the availability of free or inexpensive planting stock from the state nurseries. Few school systems avail themselves of the free services rendered by these federal and state employees.

In every subject matter there are important understandings and concepts that can be best taught on the school site. As an example, just recently a one-acre shallow pond was created in the outdoor laboratory of our high school. Basic physical, chemical, and biological data of the pond were obtained by high school students. To determine information on water volume and depth contours, mapping skills acquired in math classes were utilized by students to make a hydrographic map of the pond. Chemical data of the water, such as dissolved oxygen, carbon dioxide, and alkalinity, were collected by applying techniques developed in chemistry classes. The biology classes made a biological analysis of the water and bottom sediments. Students enrolled in conservation classes are presently compiling the data and developing a fish planting program.

The pond and surrounding land that comprise the outdoor laboratory on our high school site is used not only by science classes. Social studies classes use the outdoor laboratory to discuss social concepts. The industrial arts department has constructed a sturdy dock and a barge for water sampling on the pond as well as nesting houses, trail signs, and sampling equipment used by students to carry out basic research. The mentally retarded classes have constructed wildlife shelter and feeding demonstrations and assume the responsibility of placing food in the feeding trays during the winter months.

Art classes frequently use the laboratory for sketching and painting. Elementary and junior high school classes that do not have adequate outdoor facilities on their own school sites frequently use the outdoor laboratory for natural history, ecological, or conservation oriented field trips. Many community youth groups use the outdoor laboratory after school hours for field trips or to volunteer their services for work duties. Youth groups have been very helpful in maintaining trails in the laboratory, planting shrubs and trees, and in maintaining the various habitats. The outdoor laboratory also serves as a natural area for family groups to enjoy.

Once an outdoor laboratory is established, it will probably be used the year around. In Ann Arbor the recreation department hires a naturalist during the summer months. This individual conducts informal outdoor nature programs for early elementary children, and a formal field science program for late elementary and junior high school students at the high school outdoor laboratory. The public school system offers a seven-week summer enrichment course in field biology and conservation at the high school. This class makes extensive use of the outdoor laboratory every day. Once established, outdoor laboratories will be used by individuals, youth groups, and classes throughout the year.

Once teachers experience the amount of learning that can be achieved and the excitement generated through the use of the school site, the utilization of the outdoor environment will become a way of instructing that will add a new dimension to the teacher's effectiveness. However, few teachers are trained in our colleges and universities in methods of using the natural environment to enhance instructional goals. For this reason an inservice training program might be necessary to maximize the use of the site that has been developed to extend instruction beyond the school building. The most effective type of inservice training is that which is taught in the natural environment. It is best to offer an inservice training program regularly through the school year.

It is hoped that in the future our teacher training institutions will play a leading role in helping teachers to acquire the skill needed to effectively utilize the school site to enhance instructional programs. The higher institutions could also alert administrators to the many existing agencies at local, state, and national levels available to assist school officials in school site planning.

The school site <u>can</u> be used effectively and <u>should</u> be used to enhance instruction programs. School land <u>can</u> play a key role in helping our students increase their interest, awareness, and understanding of the natural environment. As a result of this greater awareness, and understanding of the environment, I strongly believe that students will take a more active interest in issues relating to man's environment. It is through this greater interest and understanding of the general public that progress can be made in solving some of our major resource issues of the present and the future.

PHILOSOPHY AND OBJECTIVES OF ENVIRONMENTAL EDUCATION

The following statement of the philosophy and objectives of environmental education is taken from a teacher's guide developed by the Nevada State Dept. of Education's Environmental Education Advisory Committee. After first noting that much of what passed earlier for environmental education was in reality simply conservation education, which was "primarily oriented to basic resources and did not focus on community environment and its associated problems," the statement continues:

> It is vital to effectively educate man regarding his relationship to the total environment, the interrelationship between the community and surrounding land, and opportunities for the individual to be effective in working toward the solution of environmental problems. The new approach called "environmental education" is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to solve these problems, and motivated to work toward problem solution. The major goals of environmental education are to help individuals acquire:
>
> 1. A clear understanding that man is an inseparable part of a system, consisting of man, culture, and the biophysical environment, and that man has the ability to alter the interrelationships of this system.
>
> 2. A broad understanding of the biophysical environment, both natural and manmade, and its role in contemporary society.
>
> 3. A fundamental understanding of the biophysical environmental problems confronting man, how these problems may be solved, and the responsibility of the people and government to work toward their solution.
>
> 4. Attitudes of concern for the quality of the environment that will motivate people to participate in biophysical environmental problem solving.
>
> 5. The development and maintenance of a high quality system in which man interacts with the biophysical environment to advance human welfare.

The principal feature of the philosophy of environmental education is that man is an integral part of a system from which he cannot be separated. Within this system, culture incorporates organizational strategies, technological processes, and social arrangements through which man interacts with the biophysical environment. The biophysical environment designates both the natural and manmade components of the environment.

Resources are those parts of the biophysical environment that are appraised by man as being immediately or potentially useful to him. A strong understanding of how these resources are used requires knowl-

edge of the social, political, economic, and technological processes, institutional arrangements, and aesthetic considerations which govern their utilization. The manmade components of the biophysical environment result from man's use of natural resources. An understanding of this aspect is also essential; ideally, it should include familiarity with urban and rural design, including transportation systems, spatial patterns of development, and aesthetic qualities that have a major impact on the functioning of society. Fundamental to these understandings should be the realization that the development of the manmade environment should strive for a high quality system that improves human welfare in relation to the natural environment.

Environmental problems result from the interactions of man, culture, and the biophysical environment. Pollution, the inefficient utilization and management of natural resources, the indiscriminate use of pesticides, urban blight, and transportation congestion are just a few environmental problems. These problems, caused by a complex set of biological, physical, and social factors, affect the total environmental system. People need to understand how to work toward solutions of environmental problems through laws, public policies, planning, resource management, research, technological developments, institutional arrangements, and education.

Attitude is more than simply the knowledge of a body of factual information. Instead, it is the implied combination of factual knowledge and motivating emotional concern, which result in a tendency to act.

For environmental education to achieve its greatest impact, it must do three things:

1. Provide factual information that will lead to understanding of the total biophysical environment.

2. Develop a concern for environmental quality that will motivate people to work toward solutions to biophysical environmental problems.

3. Inform people as to how they can play an effective role in achieving the goals derived from their attitudes.

GUIDELINES FOR ENVIRONMENTAL EDUCATION

Early in 1970 New York State Comr. of Education Ewald B. Nyquist directed that an environmental education task force which had been at work in the Education Dept.'s Division of General Education be expanded departmentwide. The task force convened a Colloquium on Environmental Education attended not only by state and local education personnel but by prominent scientists, businessmen, government officials, and urban planners. Out of this colloquium came the following guidelines for a program in environmental education:

1. For an effective program in environmental education, one must consider the total school society--structure of the buildings, relations of pupils and teachers, courses of study, outside school building activities.

2. A curriculum in environmental education should be cross-disciplinary in nature. Obviously, the natural sciences have a major responsibility, but even in these areas the emphasis should be on social process and not merely investigative process. The social sciences have a special responsibility to examine present social values as well as the economic, political, and social aspects of envrionmental problems. The humanities also have a significant responsibility in environmental education.

3. A curriculum should be more than merely courses of study or classroom activities. It should give pupils outdoor opportunities to live in natural environments.

4. Any curriculum should be sequential and should be for prekindergarten through adulthood. This provides special responsibilities for those in continuing education.

5. It is doubtful that separate courses in environmental education will save our environment. The need is to infuse such a program in all subject areas, prekindergarten through adult years.

6. In planning new school buildings, consideration should be given to constructing them in harmony with the natural environment and building natural environment into them.

7. For a program to be successful, teachers must be helped through inservice programs which would include environmental experiences.

8. Both formal and informal aspects of environmental education should give youth and adults the opportunity to question basic tenets of the U.S. industrial society such as growth, technology, economic determinism.

9. There is a need for interdepartmental cooperation in this area. Possibly a task force composed of representatives from several New York State governmental agencies should be organized.

10. Environmental problems should be studied in totality as complex phenomena in our industrial society--there are no simple solutions.

11. The time for such a program is now--not five years from today.

NISKAYUNA CENTRAL SCHOOL DISTRICT NO.1
Environmental Education Program (Abridged)

EARLY ELEMENTARY PROGRAM (K-2)

Objectives

Within the context of the overall objectives of the environmental community health curriculum, the objectives of the early elementary program are to introduce the student to an awareness of his environment; the ways in which it can affect his health and happiness; the responsibilities of all members of the community for maintaining their environment; and an awareness of the roles of the community health care professionals.

Content

I. Understanding the environment

- A. Defining "the environment"
- B. Living in the environment
- C. Changing the environment through pollution or improvement

II. Protecting the environment

- A. People with responsibility
  - 1. All members of the community
  - 2. Health care professionals
- B. Places for responsibility
  - 1. Home
  - 2. School
  - 3. Community
- C. Method for responsibility
  - 1. Education
  - 2. Cooperation

LATER ELEMENTARY PROGRAM (3-5)

Objectives

Within the context of the overall objectives of the environmental and community health curriculum, the objectives of the later elementary program are to present to the student those topics in the areas of epidemiology, public health, and environmental management techniques that can be given a substantially complete treatment at this stage of his development, and to introduce a conceptual background for dealing with the remaining areas of the curriculum in later years.

Content

I. Disease and the environment

A. Causes of disease
   1. Neglect and ignorance of health care
   2. Microbial contamination
B. Prevention of disease
   1. Sanitation against rodents and insects
   2. Education of health consumers

II. Man and his environment

A. Guarding against disease from food contamination and improper waste removal
B. Maintaining health at home, at work, and in the community
C. The role of government agencies, private business, and volunteer groups
D. Facing the problems of malnutrition, pollution, and inadequate housing

III. Resources and the environment

A. Need for and use of water, air, land, and living species
B. Sources and limits of resources

IV. Pollution and the environment

A. Causes and effects of air, space, land, and noise pollution
B. Prevention of pollution through individual and community action

MIDDLE SCHOOL PROGRAM (6-8)

Objectives

The objective of the middle school environmental and community health curriculum is to complete the coverage of all topics required for the accomplishment of the overall program objectives, except those where additional understanding of social and economic factors is required for comprehension of the subject matter. Thus, the middle school program should provide the bulk of the instruction that the student will receive in epidemiology, public health, and environmental management techniques. In addition it should provide a conceptual basis for the high school program by dealing with world health, the health care sector of the U.S. economy, and the social challenges of the future.

Content

I. The nature of disease

A. Incidence and distribution
B. Biological, environmental, and sociological causes

II. Health in America

A. Inequalities and achievements of health standards

B. Responsibility for health standards by various groups
C. Historic trends of health standards

III. The environment under abuse

A. Causes and effects of pollution and contamination
B. Prevention of pollution and contamination by individual and community action

IV. Challenges before us

A. Adequate treatment for all health problems
B. Improvement of world health
C. Adjustment of medical costs
D. Control of disease
E. Concern for environment
F. Continuation of research
G. Consumer education
H. Problems of population
I. Protective legislation for the consumer and the environment

Suggested Location in Program

Because of the flexibility of the middle school program, we hesitate to make definitive recommendations regarding the location of additional material. Nevertheless, certain points of compatibility between the material just outlined and the rest of the present program should be noted.

The material on the nature of disease would seem readily incorporated into the middle school science program, and could probably be dealt with adequately in five to six classroom periods. As noted earlier, there is an enormous amount of educational material available for this topic. The material on American public health status, responsibilities, air pollution, waste disposal, and other social challenges would appear more compatible with the social studies curriculum, or even more appropriate, in a combined science-social studies program. The material deserving the greatest teaching time, perhaps up to 15 to 20 classroom periods, would be that dealing with the various forms of pollution and pollution control.

HIGH SCHOOL PROGRAM (9-12)

Objectives

The objectives of the high school environmental and community health program are to enable the student to see the problems of environmental control and public health in relation to other problems of contemporary society, and to see the health care sector of the economy in relation to other social and economic institutions in the United States today.

Content

I. World health

A. Interpretation and comparison of world health statistics
B. Problems and analysis of world health problems
C. Impact of health problems on individuals and nations
C. Special problems and needs of underdeveloped areas

II. U.S. health economy

A. Statistics on health personnel in the United States
B. Trends for training and education costs of health personnel
C. Use of paramedical people
D. Current expenses for health insurance programs, treatment, facilities, and personnel
E. The government's role in current and future health programs

III. Challenges ahead

A. Building a healthy environment
B. Caring for the total individual
C. Educating the consumer
D. Defining the limits of government and of individuals

Suggested Location in Program

Within the context of the present Niskayuna High School curriculum, we believe that the above material on world health could be advantageously incorporated into the 9th- or 10th-grade social studies programs. The material on the U.S. health economy would seem a most desirable addition to the 11th-grade social studies course in the section dealing with American economic life. According to present trends, by 1975 the health care industry will represent the largest single sector of the economy, surpassing agriculture, construction, and national defense; and no adequate treatment of American economic life and institutions can be made without a study of it. The discussion of the "Challenges Ahead" could be opened in the section of the 11th-grade American Studies course, titled "American Civilization in Historic Perspective." Detailed problems of environmental quality and community health could then be pursued at greater length in the "Great Issues" elective course in the 12th grade.

Other Reports by the Editors of Education U.S.A.

The Big Talent Hunt. How leading districts recruit teachers, as told by recruiters and placement officers, #411-12446. 1969. 32 pp. $5.

Black Studies in Schools. A roundup of successful programs and policies across the nation—what school systems are doing about black and other ethnic studies programs. #411-12746. 1970. 48 pp. $4.

Differentiated Staffing: A Review of Current Policies and Programs. Tells how some schools are using this new way of deploying and paying teachers and whether it works. #411-12754. 1970. 48 pp. $4.

Federal Aid: New Directions for Education in 1970-71. Reports appropriations for 1970-71 and the 1970 amendments and revisions. Explains in detail new amendments affecting federal funding. Includes a guide to all U.S. Office of Education programs for 1971. #411-12776. 48 pp. $4.

High School Student Unrest. Tells school administrators how to anticipate protest, channel activism, and protect student rights. Tells where and why high school students are protesting. #411-12744. 1969. 48 pp. $4.

Individually Prescribed Instruction. Answers such questions as: What is IPI? How is it working in experimental elementary schools? What changes are necessary to introduce IPI into a traditional school? #411-12420. 1968. 32 pp. $3.

Preschool Breakthrough: What Works in Early Childhood Education. Comprehensive report on what's happening in early childhood education, including descriptions of federal programs, working projects, research, and trends. Specific how-to advice for those seeking to set up programs for preschoolers. #411-12774. 1970. 48 pp. $4.

Reading Crisis: The Problem and Suggested Solutions. A roundup of the most significant recent discoveries on reading problems and a guide to supervisory and teaching techniques that work. Gives step-by-step suggestions to help teachers diagnose reading difficulties, measure reading levels, pinpoint weaknesses. #411-12766. 1970. 56 pp. $4.

Religion and the Schools: From Prayer to Public Aid. Report on current school/religion conflicts: public aid to nonpublic schools, prayer in the classroom, teaching about religion, cooperation between public and nonpublic schools. #411-12772. 1970. 56 pp. $4.

The School Board Meeting. How school boards across the nation are handling new challenges from the public and the media. A roundup of meeting procedures and approaches used by school boards. #411-12770. 1970. 48 pp. $4.

Sex Education in Schools. A review of current policies and programs for the guidance of school personnel and parents. Do's and don'ts from many school systems which have successful sex education and family living programs. #411-12732. 1969. 48 pp. $3.

The Shape of Education for 1970-71. Twelve articles in concise understandable language highlight developments that have surfaced as major educational issues. A reliable sourcebook on what's new in education. #411-12760. 1970. 64 pp. $3.

Urban School Crisis: The Problem and Solutions Proposed by the Urban Education Task Force of HEW. A blueprint of the extraordinary deficiencies in our urban school system, with a clear guide for correcting them. #411-12756. 1970. 64 pp. $4.

Vocational Education: Innovations Revolutionize Career Training. A look at the boldest and most successful career training programs in elementary and secondary schools. Explains the states' approach to Voc Ed, the "cluster approach," innovative vocational guidance programs, and provisions of the new federal legislation. #411-12782. 1971. 64 pp. $4.

Address communications and make checks payable to the National School Public Relations Association, 1201 16th St., N.W., W ashington, D.C. 20036.